

CA20N
MA81
-1991
D27

Government
Publications

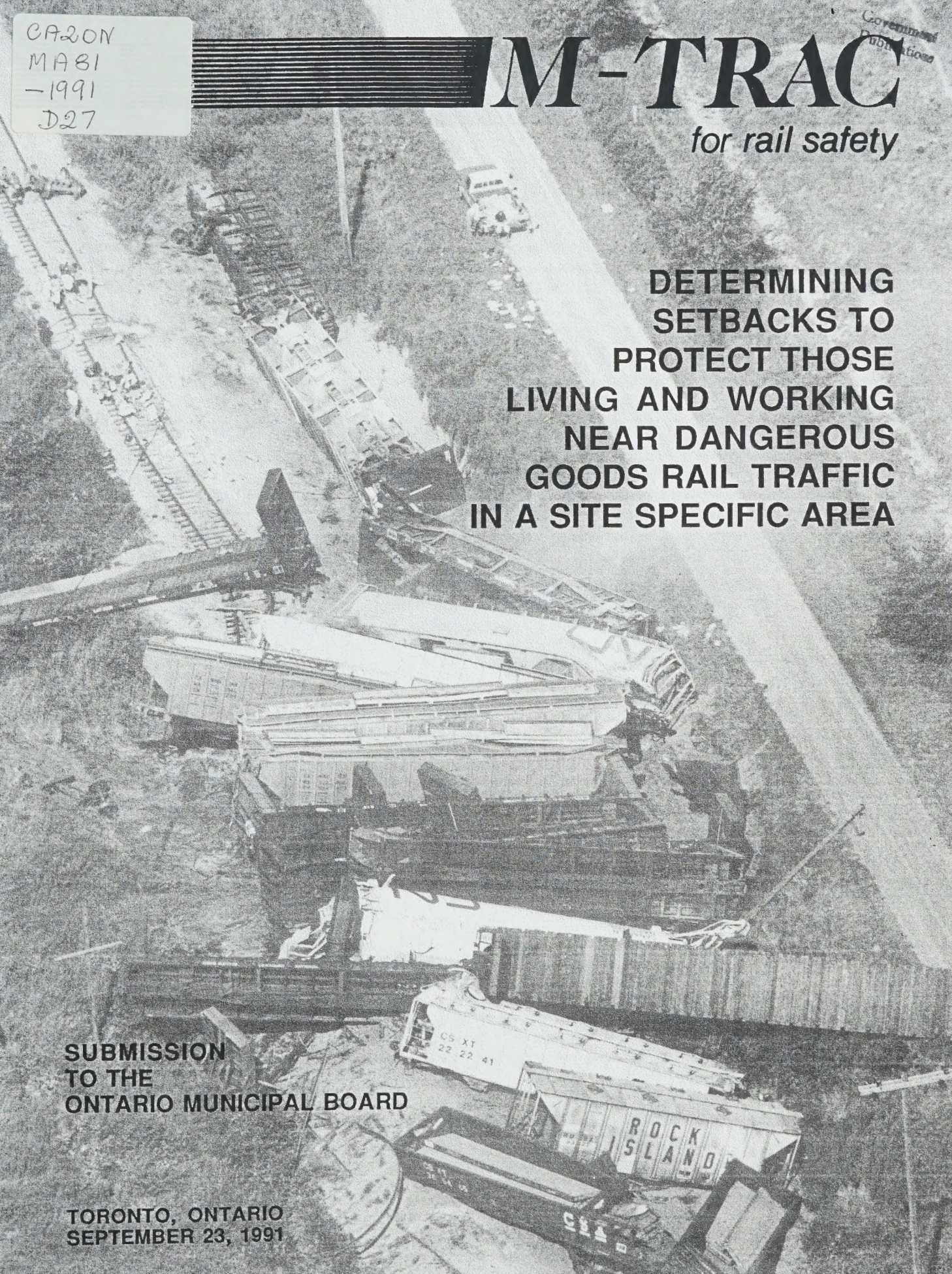
M-TRAC

for rail safety

**DETERMINING
SETBACKS TO
PROTECT THOSE
LIVING AND WORKING
NEAR DANGEROUS
GOODS RAIL TRAFFIC
IN A SITE SPECIFIC AREA**

**SUBMISSION
TO THE
ONTARIO MUNICIPAL BOARD**

**TORONTO, ONTARIO
SEPTEMBER 23, 1991**



M-TRAC is a non-profit Metrowide umbrella organization of ratepayers, residents and other groups who following the Mississauga train derailment joined forces to investigate and advocate rail safety in densely populated urban areas. Members are committed to initiate legislative and other changes necessary to ensure public safety particularly in the transport of dangerous commodities by rail.

We gratefully acknowledge contributions from individuals, groups, municipalities and the Province of Ontario whose support made this and other reports and submissions possible.

COVER PHOTO – TWISTED TURMOIL – A train derailment in Melbourne, Ont., a town near London, on August 11, 1991 forced evacuation of many homes as chemicals leaked from one of the cars. (Edward Regan/The Globe and Mail - Front page photo)

AXH 9265

M-TRAC

for rail safety

METRO TORONTO RESIDENTS' ACTION COMMITTEE

181 University Avenue, Suite 1202, Toronto, Ontario, M5H 3M7

Telex 065-24481

Phone (416) 365-0301

September 23, 1991

CHAIRMAN AND MEMBERS
ONTARIO MUNICIPAL BOARD
180 Dundas Street West
Toronto, Ontario

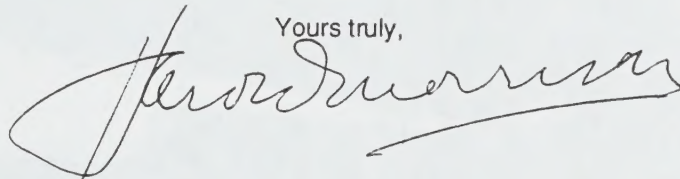
Dear Chairman and Members:

**IN THE MATTER of an Appeal by Ontario Hydro to redesignate
land at 25 Old Bridle Path Road from "Open Space" to "Low
Density Residential" to permit a plan of subdivision.**

**Minister's File No. 20-0P-3711-A44, OMB Files No. 09100096,
No. S910041, No. Z910143, No. R390342.**


We hereby present our initial submission on the above matter. Attached to the Submission are a number of appendices bearing on the subject of risk and setbacks relating to the North Toronto Subdivision which abuts the above site. It is our position that the need for minimum setbacks cannot be ignored because of the heavy movement of lethal and explosive chemicals in a very narrow corridor. We shall present such other material as may become necessary, with the Board's permission.

Yours truly,



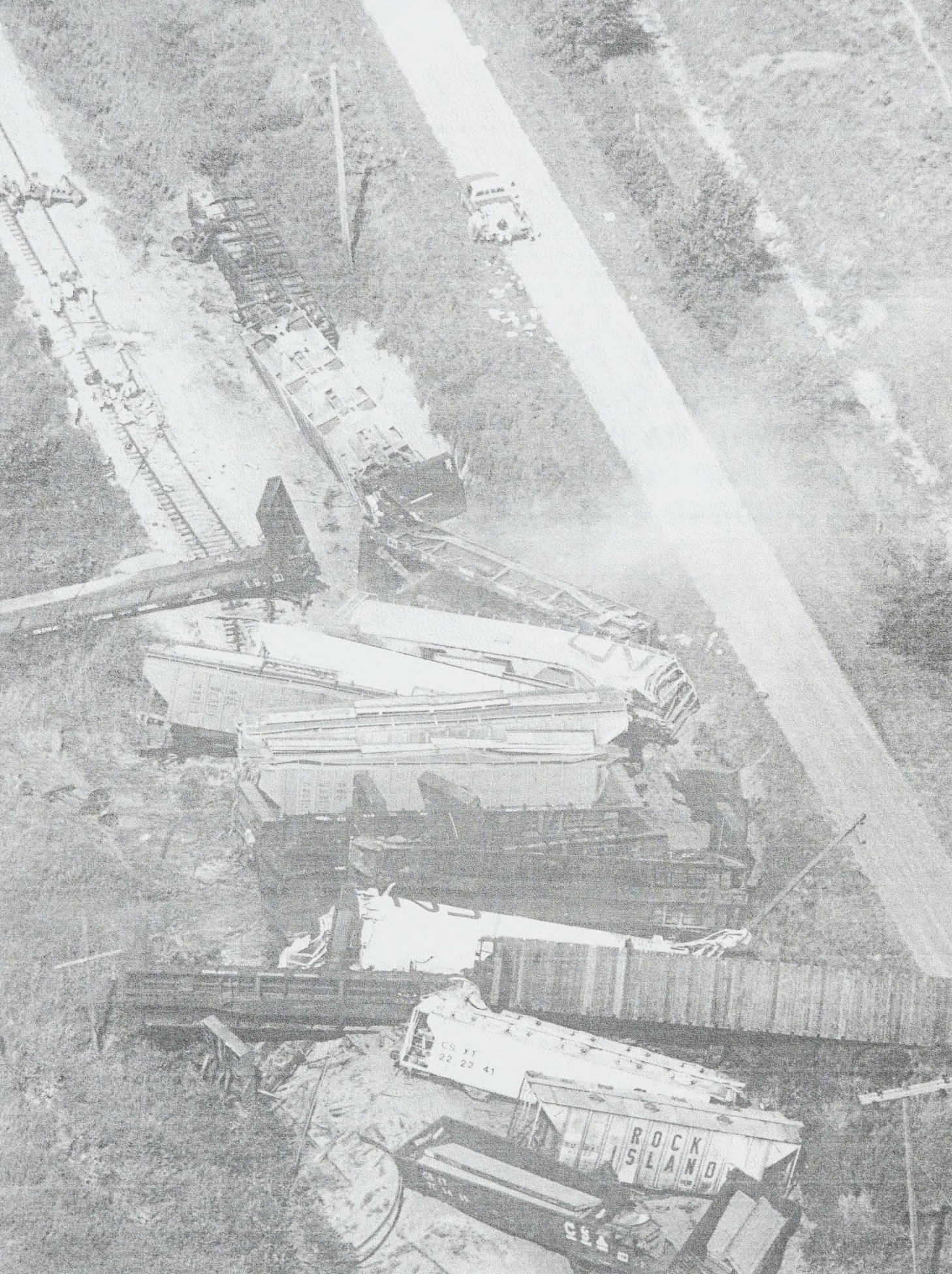
Harold Morrison
Chairman

c.c. Parties of Record



Digitized by the Internet Archive
in 2022 with funding from
University of Toronto

<https://archive.org/details/31761115475154>





AXH9265

**DETERMINING
SETBACKS TO
PROTECT THOSE
LIVING AND WORKING
NEAR DANGEROUS
GOODS RAIL TRAFFIC
IN A SITE SPECIFIC AREA**

**SUBMISSION
TO THE
ONTARIO MUNICIPAL BOARD**

**TORONTO, ONTARIO
SEPTEMBER 23, 1991**

EXECUTIVE SUMMARY

- The site under examination abuts a double-tracked dangerous goods rail line carrying large volumes of lethal and explosive chemicals.
- To protect those at risk, evidence points to the need of a 30-metre setback from the right of way as a minimum safeguard.
- Both major railways support the 30-metre requirement. More may be needed to cover the risk from the chemical traffic.
- Efforts by local governments, including Metro Toronto, to have dangerous goods traffic relocated have been fruitless. Meanwhile, the risk increases along with the rise in rail accidents.
- Ploys by developers to downgrade the risk require careful scrutiny. In cases of doubt, the benefit of doubt should be on the side of those at risk.
- Cost-cutting by railways and the federal government tend to reduce the benefits of rail safety improvements.
- Berms may have little rail crash benefit but may help those on one side of the track while worsening conditions on the other.
- Precedence exists in support of the necessary setbacks. The City of Toronto has adopted a policy of risk deterrence. Other communities have made similar moves.

A P P E N D I C E S

- A. Factors Determining Acceptable Rail Risk in Metro Toronto (M-TRAC, Nov. 1989)
- B. CP warns: two additional commuter rail lines may run through this area
- C. Minimum Risk Standard adopted by City Council
- D. CN supports corridor or segment setbacks
- E. Safety Board concerned over “significant” rise in rail accidents
- F. Accidents demonstrate gravity of threat
- G. Residue cars show significant hazard, federal official states
- H. MIACC buffer zone goals receive strong national support
- I. Setbacks high priority for Marathon Lands Working Committee
- J. Planning Advisory Committee refuses 25 Olde Bridle Path application
- K. Provincial Consultant reports on protection of property adjacent to railways
- L. City of Vaughan By-law calls for 30-metre setback

1. Our appearance relates to the security and safety of those who live and work near a transport system that has changed over the years and now carries one of the heaviest volumes of lethal and explosive chemicals in the entire country.

2. This specific site with its sloping contours abuts the double-tracked Canadian Pacific line, otherwise known as the North Toronto Subdivision, that curves through a relatively narrow corridor in a very heavily populated area, characterized by a sprinkling of high-risk industry, schools and other public institutions, commercial structures and many residential dwellings.

3. The M-TRAC rail safety organization grew out of the 1979 Mississauga derailment and has consistently fought for rail improvements to reduce risks which have been calculated and confirmed by many studies. Unfortunately, despite our efforts, some of these risks continue to exist, aggravated by changes in rail company policy and declining federal enthusiasm for regulation enforcement, with increasing volumes of dangerous goods moving night and day on track adjacent to this and other Metro sites.

4. Through the judicial process and other means, we have managed to obtain some improvements. However, it appears that the risks which continue to concern the Toronto community are likely to remain until the dangerous goods rail traffic can be relocated into a corridor away from the public. The IBI Group, which now sits with Ontario Hydro, has been instrumental in the selection of possible

alternative corridors suitable for this traffic. The IBI Group was the major and most active consultant of the Toronto Area Rail Transportation of Dangerous Goods Task Force. This federal task force, of which I was a member, sat for two years during 1986-88, under the chairmanship of Mr. Harold Gilbert, former Deputy Minister of Transport for the Province of Ontario.

5. Relocating the dangerous goods traffic would require a great deal of political initiative and it is apparent that other political issues have precedence. So we must find other means, even interim means, of securing some measure of protection. One of the recognized measures is setbacks to provide a buffer between the dangerous products and communities at risk. We believe after much study that buffers are necessary for those at risk in industrial plants, commercial establishments and for those in schools, hospitals, nursing homes, senior citizen apartments and residential dwellings.

6. We are not alone in this pursuit. There is a wide body of opinion right across the country and in the United States that some form of buffer is essential. This opinion tends to be swayed by frightening rail accidents in which chemical spills lead to soil contamination, drinking water threats, spectacular fires and vapour clouds, pool fires and tank car explosions.

7. It takes no vivid imagination to visualize the destructive forces of just one carload of propane exploding at this or other sites. No one can be accused of exaggeration in reflecting on the damage of the 1979 Mississauga accident and the forced evacuation of some 225,000 people. The dangers are there and

although the carriers have introduced operational improvements, other countering activities have tended to reduce the full benefits of such improvements. We shall address this matter further as we proceed.

8. The main approach of local communities in dealing with the dangerous goods problem is to get federal action on the relocation of the chemical traffic. Federal authorities have shown interest but in the present political turmoil we have little hope for immediate action. The City of Vaughan has decided to introduce a 30-metre setback from the railway right of way. The City of Regina has decided on a far more extensive buffer. The City of Edmonton has taken action. And here in Toronto the local government has agreed to introduce a safety standard of no more than 10 chances in a million of a rail fatality to safeguard those at risk from this railway traffic. Generally, this would translate into a 30-metre setback for many parts of Toronto, although some areas would require other mitigating measures to come within this standard. The Toronto standard is similar to one already in force in the United Kingdom.

9. On the Federal level, one of the groups undertaking much work in the field of buffers is the committee known as MIACC – Major Industrial Accidents Coordinating Committee – which includes members from the chemical industry, the federal government, emergency response forces and provincial administrations. This group is convinced that buffers are essential and it has begun its plan of persuading provinces and municipalities to push ahead with setback policies.

10. On the opposite side, we must mention that certain developers and politicians representing these developers are trying to push the other way. They don't want to see their planning restrained. They try to place the lowest possible factor on risk and their efforts sometimes confuse the politicians who tend to think in terms of supporter interests. It makes for great difficulties in objective planning. Some want to build right against the track and damn the risks. We would not believe that Ontario Hydro would want to follow such a policy. We have found occasion to praise Ontario Hydro's relations with communities as a model to be followed by other industrial entities. We are sure that Ontario Hydro would not want to impose undue risks on unsuspecting home buyers simply for the purpose of realizing the highest possible price for a piece of land picked up by Ontario Hydro for \$8,000.



Tank car 'bomb' of deadly chlorine gas forces evacuation of 225,000 residents while fire fighters confront blazing and rocketing propane tank cars following spectacular derailment of CP freight train at Mississauga, Ontario on November 11, 1979. (Photo: Globe and Mail)

11. Some developers not only want to build right up to the right of way but over the track, to form a platform for holding high-rise office towers and similar structures. In Atlanta, Georgia, part of the plaza of the World Congress Centre dropped 30 feet to the CSX tracks after it was struck by a derailed train. Even though we are not sure whether dangerous goods were moving on that track, the undertaking was, to say the least, a high-risk venture.

12. During the pre-hearing conference, I was asked whether 30 metres would be sufficient at this specific site now under examination and I replied that it should suffice as a minimum setback, even though the consultant who had examined the entire corridor recommended something like 59 metres. We sense the pressures at work and the struggle that would ensue were we to seek maximum safeguards. But surely the public at risk is entitled to some measure of protection.

13. It is interesting to note, too, that the major railways, Canadian Pacific and Canadian National, recommend 30-metre setbacks from the right of way. The letters on this subject are before you as appendices to this submission. It should be borne in mind that the railways' recommendations are based on unregulated traffic, cars not carrying dangerous goods. If you consider that the lethal and explosive chemicals dramatically increase the risk on that line, you may want to consider an additional buffer and the 30 metres may have to become 40 metres or even 50 metres, simply as a logical conclusion.

14. I asked one consultant, for example, what is the logical limit of potential danger when a tank car of propane explodes on the right of way. He estimated that you may need 2 1/2 kilometres in any direction. Even an exploding tank car of gasoline could reach out a distance of 100 metres. The Mississauga derailment provided frightening proof of the damaging power of these dangerous goods loads. And the Mississauga accident was by no means the only rail accident in this area. We have had many accidents and the end of them is nowhere in sight.

15. Since the pre-hearing conference, Canadian Pacific has raised the possibility that the two tracks on that North Toronto Subdivision may be doubled to four with passenger service added to the present high volume of dangerous goods traffic. It is a bit horrifying to imagine what may happen if a chemical rail spill occurs amid a heavy passenger movement. We certainly don't need another Hinton disaster.

16. Expanding the line to four tracks in this very narrow corridor would bring trains to the very edge of the rail fence. In our view, a 30-metre setback under such circumstances would be playing high stakes with expanding risks. Something more than 30 metres would be necessary.

17. There is still another factor: the proposed berm or 15-foot wall Ontario Hydro proposes to plant at the foot of the site at the right of way. This may improve the cosmetics by screening the rail line from the north but there seems to have been little attention paid to the effect this wall may have on the comfort and security of those living on the south side of the track. We have had very little

experience with these berms as a rail safety measure. There is a question whether locomotives hitting such a berm may bounce back and land on the south side off the right of way. There is a possibility in a derailment that some residue cars on the train may land on top of the car in front and eventually on the site itself. Berms can also act as barriers when emergency response forces try to get fast entry to the accident site. There are all sorts of factors involved in berms or concrete crash walls and other attempts to mitigate the risk and we would urge the Board to consider asking for a full technical investigation. So far, the results are not reassuring.

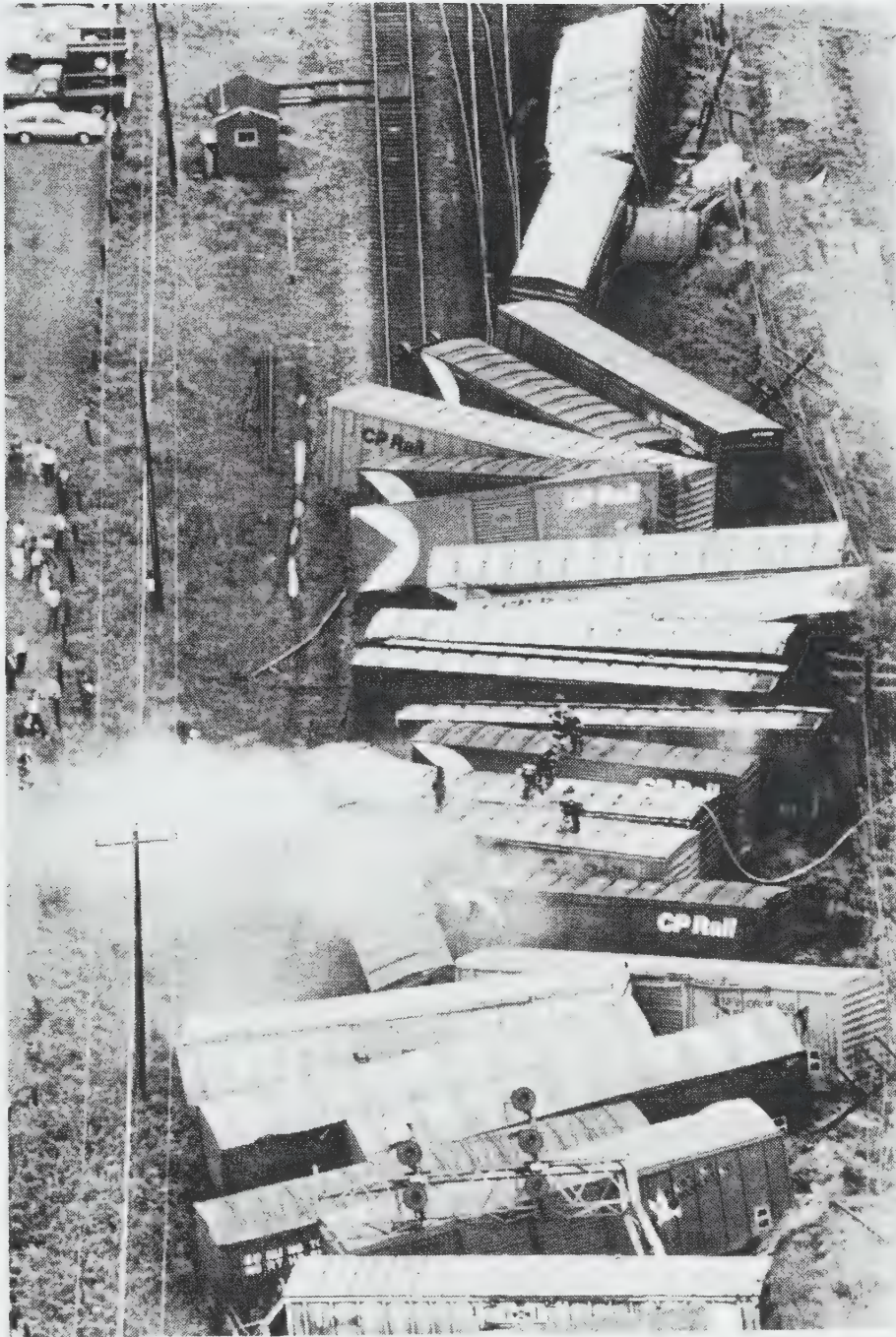
18. A curiosity of rail accidents is that each seems to have its own peculiarities. No two accidents seem to be exactly alike. In one case the cause may have been a broken wheel; in another bad steel or bad welding at the seams. In other cases it may be broken track or track out of alignment. You can find hot box detectors that don't work and signals that suddenly fail.

19. What we do know is that rail accidents are increasing. And dangerous goods incidents are rising at an alarming rate. So much so that federal authorities are worried. They are about to undertake a special investigation, quietly and out of public reach. But they know the situation is unhealthy. It is a strange thing about human behavior - - authorities tend to wait for someone to be killed before they install a traffic light. I've seen it here and I've seen it overseas. Local groups will press and press for a traffic light at a dangerous intersection and nothing is

done until a major crash brings death. Then suddenly the traffic light becomes a necessity.

20. It may be the same with rail accidents. Some communities, such as Toronto, feel they are more sophisticated and hire experienced consultants to tell them what the risks are and how to reduce them. These risk consultants have a difficult job and the field is relatively new. But it is the politicians who have the final say on what is to be done and I can tell you that the political decisions are not always on the side of those at risk. Ontario Hydro has spent a great deal of money providing safety in nuclear power installations. The cost of such safety can be very high. The reluctance by politicians to provide similar funds for safety in chemical rail disasters is very apparent. But chemical rail disasters can bring extensive and lasting damage. Removal of contaminated soil can be very costly; cleaning up poisoned drinking water is no small job. In some cases the cost of a derailment can rise into many millions of dollars.

21. At this specific site the Board will undoubtedly want to decide whether the various risk estimates are reasonable or overstated; whether the risk is high or low; whether more accidents occur on single tracks or on double tracks; whether more accidents occur at grade or on embankments, otherwise known as fill; whether changes in rail operations have improved safety or whether other factors abound. You might want to consider whether slowing the trains at this particular spot might improve conditions and if so what power the Board may have to influence changes that could mitigate the risk.



THE POTENTIAL FOR A MAJOR DISASTER - Three locomotives and 31 freight cars on a 103 - car train carrying dangerous chemical jump the tracks on the CP mainline near Don Mills Rd. and Eglinton Ave., on July 14, 1987. (Photo: Toronto Sun)

22. Under Section 48 of the Ontario Municipal Board Act, as amended, the Board has certain powers to require

“any person, company, corporation or municipality, subject to its jurisdiction to adopt such means and appliances and to take and use such precautions as the Board considers necessary or expedient for the safety of life and property.”

It is clear that the Board can order a municipality to impose required setbacks just as it can order a corporation or individual to undertake certain precautions in the exercise of their activities to protect life and property. However, the rail corridor in this case is under federal jurisdiction and the regulations pertaining to the operations on this line come from Ottawa. It appears intolerable and unjust to local residents that a corporation can operate almost with immunity from local complaint while imposing a form of hardship and risk to those nearby.

23. The people of Toronto did not ask that the Canadian Pacific transfer huge volumes of dangerous chemicals through this very narrow corridor. Eighty per cent of this dangerous goods traffic neither originates nor terminates in Toronto. The downtown corridor is simply a convenient railway bridge for the company, forming the cheapest way of getting its cargoes to the Agincourt yard in Scarborough for classification and rerouting. This includes running the cargoes back over the North Toronto Subdivision to reach other destinations in Canada and the United States.

24. Changes in Canadian Pacific policy have led to increased traffic on that North Toronto Subdivision. Classification in the Lambton Yard in West Toronto has been virtually shut down and all the rail cars involved are shifted east to Agincourt where \$6,000,000 went into track expansion so that more cargo can be handled. Is frequency of traffic a factor in accident occurrence? We believe it is. Many of the more damaging accidents have occurred in what may be called high-density traffic areas and high frequency areas. More accidents occur on embankments or fill than at grade or in cut.

25. And there are still other factors: Trains have become longer and heavier. Crews have been reduced. There no longer is a man at the back of the trains for added protection and observation. The three men left on the trains were bunched up in the front cabs and now CP is planning to cut the numbers to two men. It may be very difficult for the front-end crew to observe a fire or other problems a mile-and-a-half back of the cab.

26. The rail company will of course argue that it has made improvements in track and signalling, train marshalling and trackside warning. But complaints coming to our attention speak of poor inspections, problems with employee morale, problems with equipment, wheels, bolsters, welds and policies that tend to put market forces ahead of safety.

27. The federal government imposed a speed restraint on dangerous goods traffic in this specific corridor. The governments of Metro Toronto and other municipalities pleaded for this speed restraint as a safety measure. But the rail companies are pressing for removal of this speed restraint because it says speed restraint is a cost factor. It may be a horrifying brew if the speed restraint is removed; if the line is expanded to four tracks and if passenger service is mixed with dangerous goods traffic in this narrow corridor. Yes, it will be cost effective by maximizing the use of the line. But at what risk? Surely, intuition alone would raise the possibility of a terrible accident that might have been prevented had safety taken priority over marketing gains.

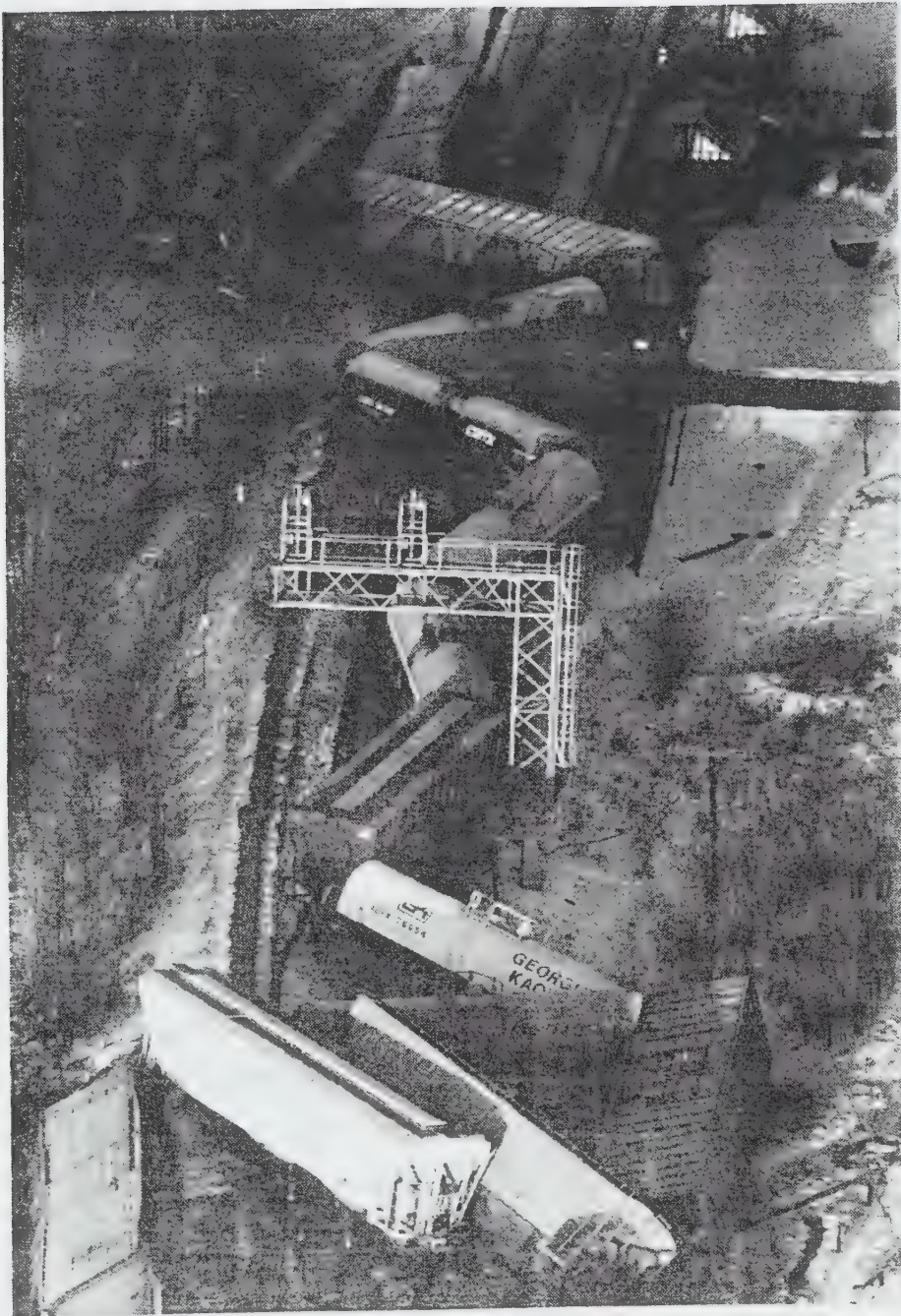
28. Now, among the bits of evidence placed before you at the opening of this hearing there is the risk evaluation study by Concord Scientific Corporation, which has been selected by the City of Toronto to undertake the project, and you will also find a so-called "critique" undertaken by Mr. Gordon W. English of the Canadian Institute of Guided Ground Transport at Queen's University.

29. It is apparent from this "critique" that the aim is to take issue with the findings of the Concord Scientific Corporation study; to discredit some of the findings of the Corporation and thereby cast doubt on the Corporation's conclusions and finally to raise doubts in the Board's mind whether the risk is as Concord Scientific estimates. This process is very old and much attempted in court proceedings of this kind. No doubt there are some very shrewd

observations by Mr. English and observations Concord Scientific may appreciate. You can take two risk assessors or evaluators looking at the same site and come up with different conclusions. However, in this case we would ask the Board to approach the "critique" with great caution. There appears to be more left out of Mr. English's "critique" than put into it. There is a lot of material which Mr. English appears to have skipped over while concentrating on one portion of the total equation.

30. Indeed, if we may pursue this one item for a moment longer, we must raise suspicions whether Mr. English was trying to enlighten the Board or deliberately mislead it. I hesitate to put such harsh treatment on Mr. English's work but our own information raises grave worries about Mr. English's intentions and indeed the intentions of the IBI Group which may have selected Mr. English for this purpose and Ontario Hydro which must have paid the bill for this what I believe to be a distasteful operation.

31. Undoubtedly, Mr. English will explain his "critique" to the Board. Doubtless, he will explain how he came to criticize work of his own institute for as I understand it, the CIGGT provided the figures on which the frequency element of the risks analyses was computed. I am sure Mr. English will tell you further that the modifiers for the Concord Scientific data received from CIGGT were provided by another reputable company and that finally the review of Concord's conclusions was conducted by CIGGT, Delcan and the Institute for Risk Research at the University of Waterloo. As I say, this is my own understanding of what took place



Old wheel shattered under stress, causing January 2, 1990, derailment that strewn 23 cars across tracks near 1979 Mississauga derailment site, causing an estimated \$1 million damage. (Photo: Toronto Star)

and Mr. English may provide his own version. I am not sure where Mr. English got the basic Concord material to conduct his “critique” but I would venture to say the working papers were provided by persons other than Concord Scientific. Indeed, as I understand it, Mr. English did not communicate with Concord Scientific to say he is conducting a review of Concord Scientific material, so that Concord Scientific was caught by surprise. Perhaps we will learn more about this during the course of this hearing. But I can say, in pursuing Mr. English’s material and consulting other persons more knowledgeable than I that there are errors in fact in Mr. English’s work. More so, what he has left out may be more valuable than what he has put in.

32. The risk assessments usually involve two basic elements – the frequency of accidents and the consequences. While Mr. English labels his “critique” as dealing with “risk assessments”, he really only dwells on the prospect of frequency of accidents, without taking into consideration such aspects as accidents at grade compared to accidents on fill or embankments and he tells you nothing about the “knock-on” effect where a rail tank car on derailment may hit a high-tension hydro tower and whether such towers exist nearby. He dwells on the dangers of turnouts or switches without telling you the location of specific switches on the North Toronto subdivision.

33. The reality is that between 50 and 80 dangerous goods tank cars including residue cars move over this double track segment each day. Sometimes the speed restraint is obeyed; sometimes it is not. Whenever local

residents complain to the federal regulator, the Transport Canada Rail Safety regional office in Toronto, about the perceived high speeds of these trains, the regulator seems unable to find a breach of the speed restraint. But of course the dangerous goods residue cars are not covered by the speed limit. They are allowed to travel at company-set speed of 50 miles an hour and the marshalling of these cars is not regulated. These residue cars are supposed to have chemical contents of two per cent or less of the original load but federal investigators discovered to their surprise just a year or so ago that some residue cars carry a lot more than two per cent of the original load. During an investigation into a serious double derailment at Brampton, Ontario, last year, the investigators found that a tank car marked residue and last containing chlorine had a load of 18,200 pounds of chlorine and should not have been placarded RESIDUE. Later, the Director of the Dangerous Goods Directorate in Transport Canada issued a letter warning of the dangers of the RESIDUE cars but that did nothing to change the practices on the North Toronto Subdivision. To this day the residue cars swing through the downtown corridor at high speed. The risk is there but I doubt that all risk evaluators take this into consideration. It is the old problem: unless you become a fatality, you don't get into the risk figures. Third party damage doesn't come directly into the figures either.

34. I only relate these points to emphasize the seriousness of the situation. The Board has dealt with these matters before in other cases and generally has agreed with the railways that the setback is a requirement that cannot be ignored. The Board has a role to play in the protection of life and property and it is apparent that the precedent has already been established. But we would ask the Board in

this specific case to declare once again the value and necessity of the minimum 30-metre setback, certainly in built-up areas where the consequences of a derailment or collision or dangerous goods leak can be very serious even though the frequency of such occurrences may be low. With the large loads of dangerous goods on this subdivision, it would take only one accident to destroy a large portion of the community, with its attending huge human suffering and material loss. On this segment of the subdivision we have multiple switches, bridges, and a mixture of population adjacent to the track, including three public schools. Difficulty of evacuation must be considered in any risk situation. Areas where emergency responders can gather and centralize their operations must be provided. Both the Toronto Fire Department and the Metro Emergency Response Co-ordinator have called for 30-metre setbacks as a minimum necessity in our congested downtown area. The Marathon Lands Working Community, which included community associations, prepared development guidelines setting 30-metre setbacks as the highest priority not only for residential and institutional development but commercial development as well.

35. The matter may be highly technical but the primary knowledge about chemicals and environmental problems is spreading. The argument that the risk is low in this area and that there is no need for special precautions must be dismissed as untenable. Even the railways acknowledge that the health and welfare of those who live near the track may be affected by rail operations. The strongest emphasis must be placed on safeguards and where there is doubt the doubt should be to the benefit of the public at risk.

We appreciate the opportunity to appear before you.



Deadly chlorine gas in residue tank car placed Brampton residents and rescuers at risk when railway car catapulted off the track following collision of two trains on February 25, 1990. (Photo: Toronto Star)

An aerial, black and white photograph of a large-scale construction project. In the foreground, a massive crane with a long lattice boom is positioned on a dirt area. To its right, a large, dark, rectangular structure, possibly a bridge pier or a large container, stands prominently. The background is filled with various construction materials, equipment, and partially completed structures, all set against a backdrop of trees and distant buildings.

M-TRAC

for rail safety

**FACTORS
DETERMINING ACCEPTABLE
RAIL RISK
IN METRO TORONTO**

TORONTO, ONTARIO
NOVEMBER 1989

M-TRAC is a non-profit Metrowide umbrella organization of ratepayers, residents and other groups who following the Mississauga train derailment joined forces to investigate and advocate rail safety in densely populated urban areas. Members are committed to initiate legislative and other changes necessary to ensure public safety particularly in the transport of dangerous commodities by rail.

We gratefully acknowledge contributions from individuals, groups, municipalities and the Province of Ontario whose support made this and other reports and submissions possible.

ELMA, MAN. - Residents evacuation forced by dangerous chemicals freight train derailment and fire, October 27, 1989.
(Cover photo: Wayne Glowacki, Winnipeg Free Press)



M-TRAC

for rail safety

METRO TORONTO RESIDENTS' ACTION COMMITTEE

181 University Avenue, Suite 1202, Toronto, Ontario, M5H 3M7

Telex 065-24481

Phone (416) 365-0301

FACTORS DETERMINING ACCEPTABLE RAIL RISK IN METRO TORONTO

TORONTO, ONTARIO
NOVEMBER 1989

SUMMARY

	SECTION
REMOVING A COMMUNITY THREAT – MAYOR'S REMARKS	1
SPECIAL HAZARD SECTIONS	2
DANGEROUS GOODS RAIL RISK – C.P. R. NORTH TORONTO SUBDIVISION	3
UNACCEPTABLE RISK	4
EVACUATION – AN IMMENSE PROBLEM FACING EMERGENCY RESPONSE OFFICIALS	5
THE KNOCK-ON EFFECT – SETBACKS FOR CHEMICAL STORAGE	6
EMERGENCY AND MAINTENANCE RIGHT-OF-WAY ACCESS	7
BUFFERS – FEDERAL AND PROVINCIAL AUTHORITIES TAKE A STAND	8
RAILWAYS WANT SETBACKS – DEVELOPER CONCERNED	9
TORONTO SAFETY POLICY PENDING – RISK CONSULTANT RETAINED	10



SECTION 1

REMOVING A COMMUNITY THREAT

... until the risk of death is eliminated, there can be no relief for those who live and work in the hazard and accident zones.

— Mayor Art Eggleton
City of Toronto
Address to the Toronto Area Rail
Transportation of Dangerous Goods Task
Force – January 12, 1988



The City of Toronto
Arthur C. Eggleton
Mayor

Remarks by
Mayor Art Eggleton
to the Toronto Area Rail Transportation
of Dangerous Goods Task Force

Tuesday January 12, 1988

REMOVING A COMMUNITY THREAT

Mr. Chairman and Members of the Task Force,

The serious problems associated with the haulage of dangerous chemicals by rail through our busy downtown corridors are all too well known to members of the Task Force. Without seeming to be melodramatic, I think it fair to say that everyone realizes what might have happened had the 1979 Mississauga derailment occurred just 20 minutes later. Your consultants have estimated that the resultant damage might have reached \$1 billion, along with the grim reality of many dead and injured as the

escaping chlorine seeped through our streets and into our subway system.

We escaped but we may not be as fortunate again.

We recognize that these chemicals and their residues must be transported and that railways probably provide the best methodology. Yet there is a major safety issue involved, and there is no question that community safety must be the main justification for implementing major and necessary network revisions to today's rail system in the City of Toronto and the Greater Toronto Area.

The three routes carrying the heavy through volumes of dangerous goods in the inner city are the community's main focus of concern. They make up the major freight routes and represent, between them, over half the estimated risk potential in the Greater Toronto Area and are known as **Special Hazard Sections** (shown in Figure 1).

Statistically, the Task Force's measure of Societal Risk indicates that, on average, the **Special Hazard Sections** are burdened with a risk level ten times higher than the remaining rail

segments within the Greater Toronto Area. This reflects both the heavy dangerous commodity flows (up to 75 carloads daily) and the high level of population exposure — 131,000 people living in the accident consequence zones of these sections.

In addition to the 131,000 residents area — 52,000 employees, 22,000 school children and 1,300 hospital occupants are present in these zones on a regular basis.

The hazard features of these sections can be characterized as follows:

1. They employ elevated rails for much of their length, with residential land uses immediately adjacent to narrow rights-of-way;
2. Portions of the Bloor, Yonge and Spadina subways are located in the rail hazard zones, carrying hundreds of thousands of passengers daily;

3. Widespread catchment basins — physically depressed areas which could retain escaped toxic and flammable substances — are closeby;
4. Thousands of students experience high exposure to these hazards levels--several school yards abut directly on the right-of-way;
5. Dupont Street, a busy shopping and industrial street runs within 100 feet of the North Toronto Subdivision;
6. The Hillcrest TTC Yards and subway control centre, major seniors' residences, and a hydro transmission line also abut the North Toronto right-of-way;
7. The Lambton Yard, one of the most dangerous rail sites is adjacent to west Toronto.

This review of some of the details of the hazards on these critical corridors demonstrates that community safety is a complex subject.

It is not only fears of another Mississauga derailment that concern us. There have been other rail accidents in and near the Metro community since then. It can take only one serious error, one serious mishap, to bring disaster into our midst.

In City Council's view, big reductions in risks will come about ultimately through rail relocation. Your consultants have calculated the probable number of deaths that may occur if nothing is done, and until the risk of death is eliminated, there can be no relief for those who live and work in the hazard and accident zones.

We acknowledge, of course, that the City of Toronto would benefit from relocation — beyond the incalculable importance of securing the safety of our people. Removing the through shipments and train loads would likely free up new residential opportunities along the corridors, for example. Some see opportunities for the use of the available line capacity for another important GO transit corridor.

Your consultants have advised you on the feasibility of alternative routes for these dangerous goods, routes which would provide protection for the public as well as easy access for

SECTION 2

SPECIAL HAZARD SECTIONS

DC (dangerous commodities) traffic diversion could diminish the need for restrictive zoning in rail corridors thus ensuring the opportunity to respond to land development proposals. (parenthesis added)

— Philip E. Wade Associates
A Strategic Overview, Hazardous Goods
Transportation by Rail in Toronto –
November 1986

Phillip E. Wade Associates
Transportation and Community Planners

Strategic Overview Transportation Toronto

CGT

63561

CAPY 127 118

CAPY 27532

CAPY 33554

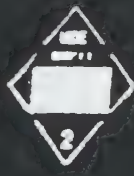
LITRES

IMP GA

US GA

30 TON STEEL WHEELS

SPRINGS D-3



City of Toronto
Planning and Development Department

Figure 2.2

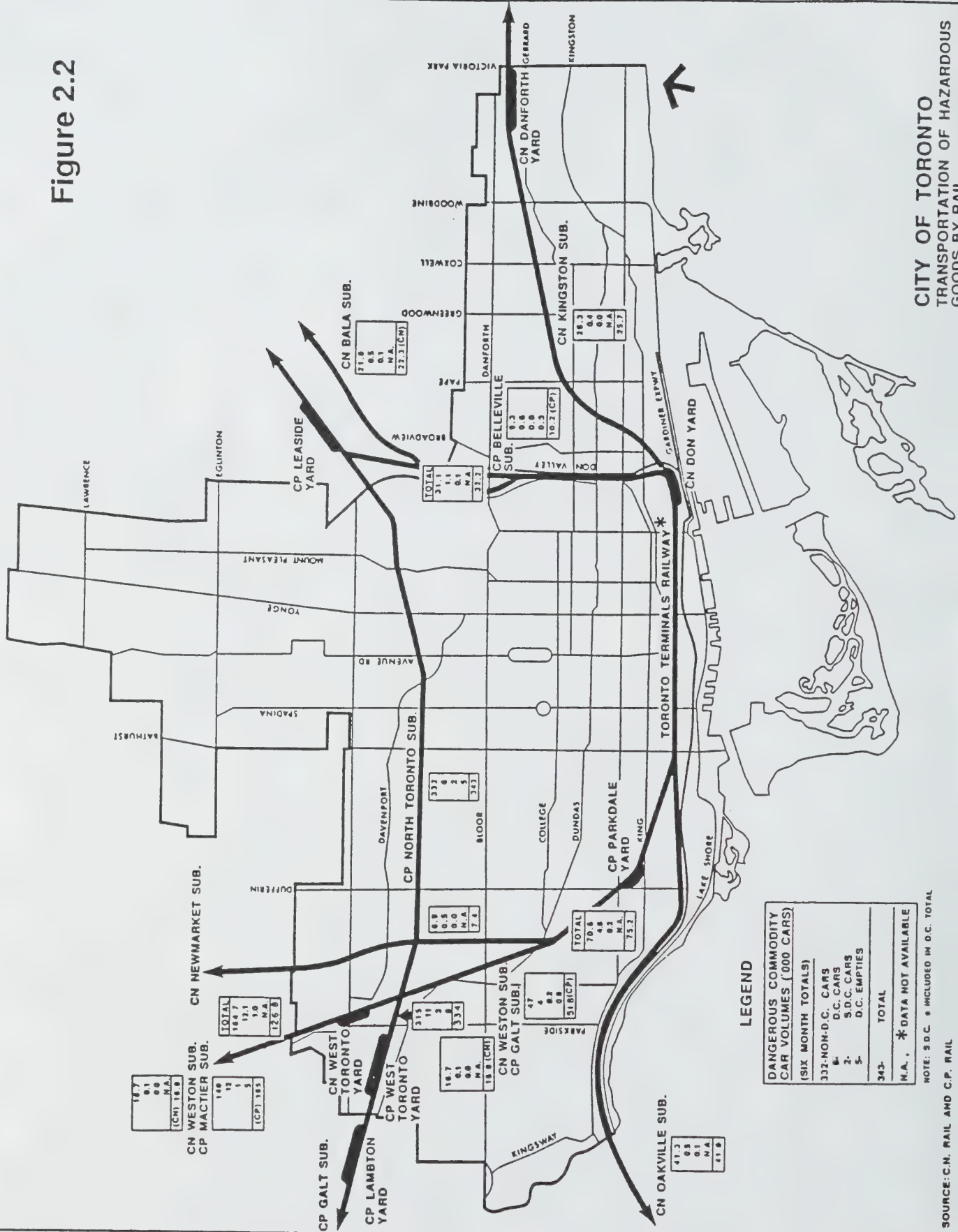
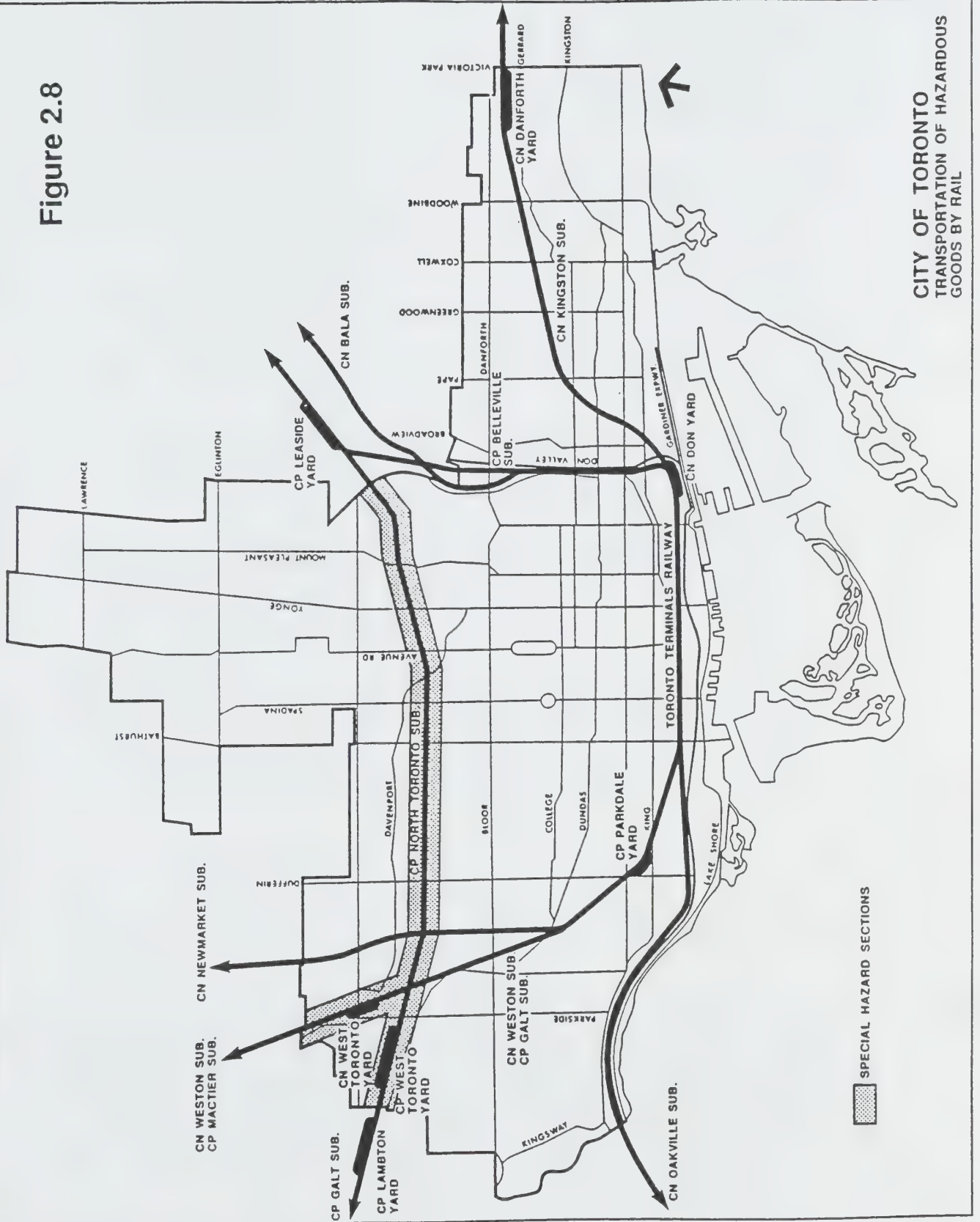


Figure 2.8



CITY OF TORONTO
TRANSPORTATION OF HAZARDOUS
GOODS BY RAIL

TABLE 2.10

EXTENT OF HAZARD AREA

<u>Rail Hazard Incident Type</u>	<u>Lethal Zone Radius (feet)</u>
Torch Fire	60
Pool Fire	600
Vapor Fire	1 180
Vapor Cloud Explosion	3 600
BLEVE	590
Toxic Gas Release	2 000

Source: Generating Hazardous Material Risk Profiles on Railroad Routes. Raj and Glickman, Transportation Research Board, 1985.

It can be noted that the above impact ranges are computed on the assumption of a full release of a tank car's contents. A release of partial contents has a higher probability but a correspondingly smaller area of impact. The above research is purported to reflect the effect of tank car retrofit on DC incidents.

2.6 - EXPECTED IMPACTS ON SELECTED CITY SITES

The following discussion deals with the impact or consequences of the above hazardous incidents upon specific locations within the City of Toronto. The following three sites have been selected for examination of accident impact in three representative rail corridor sections in Toronto.

1. Rosedale between Governor's Bridge and Mount Pleasant Road.
2. Galt/Weston Subdivisions, north of Queen Street.
3. The Union Station area.

Figure 2.5 shows these corridor sites in the Toronto area.

The information in this chapter is influenced by a recent paper dealing with the effect of urban topography upon the impact of rail incidents occurring in the Toronto area.⁶ This paper makes the following comments about the effect of urban topography on accident impacts:

"Release consequence analyses undertaken to predict the effects of failure of containment of propane storage and shipping vessels routinely assumed ideal conditions, i.e. flat terrain without nearby obstructions. In particular, such simplifications are usually made with heavy gas dispersion calculations.

Topography of the release site not only influences the dispersion of heavy gases, but also directly affects the propagation of a flame front through a flammable vapor cloud mixture, the impact of thermal radiation and the trajectories of vessel fragments.

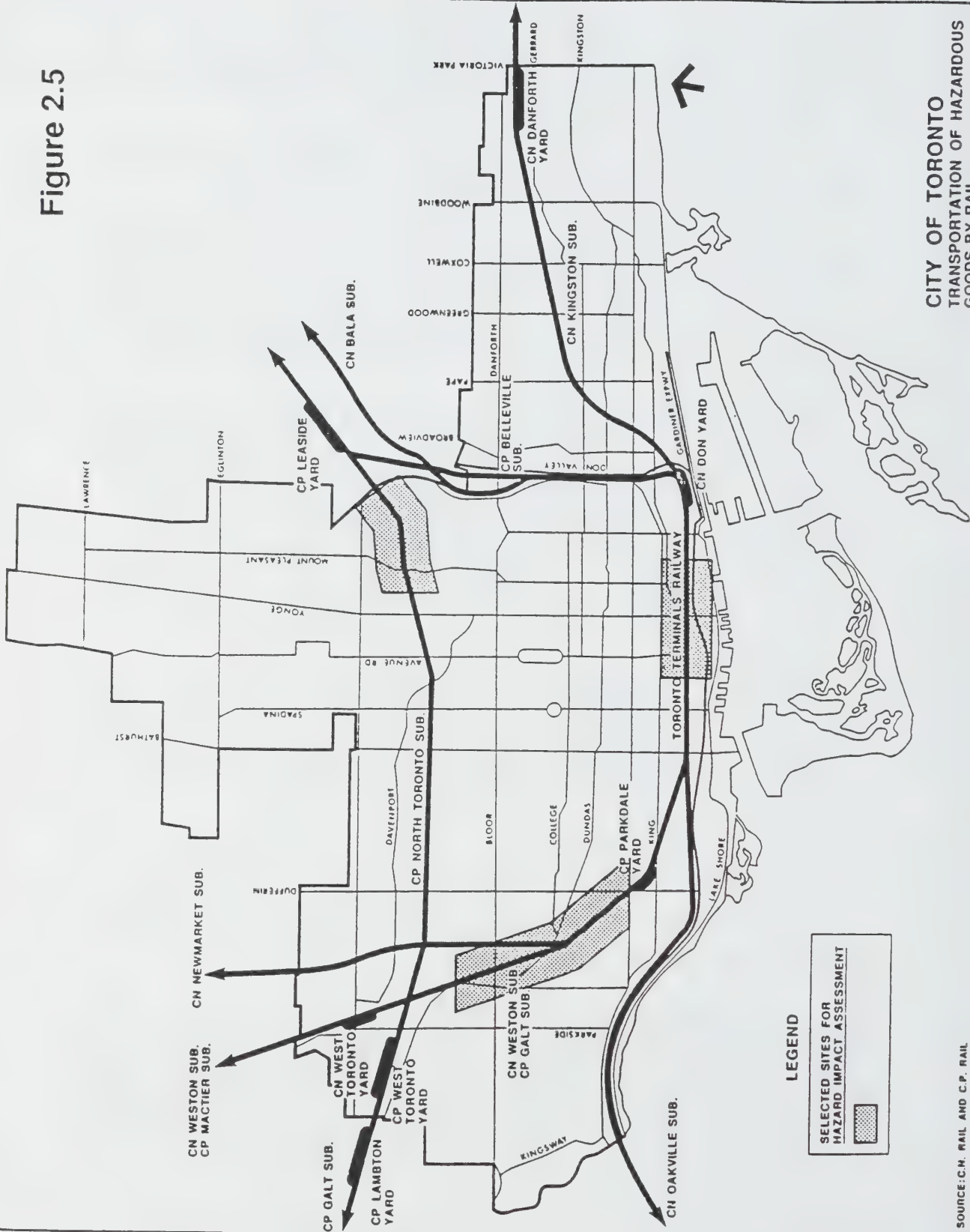
Seldom are ideal topographical conditions encountered along propane tank car shipping routes. The Canadian prairies approximate such perfect conditions, but examination of previous accidents reveals that a large proportion of propane releases occurred near busy population centers."⁶

In the analysis carried out of hazard from rail accidents involving DCs, two corridors were defined which identified two spatial categories of hazard potential. These zones are referred to in the following discussion and are defined as follows.

High Consequence Zone (HCZ) The HCZ represents basically a 250 m distance from the railway tracks with adjustment for special topographical features where relevant (i.e. escarpments, catchment basins, ravines, etc). It represents essentially the extent of impact of the most probable and/or most destructive rail incident categories.



Figure 2.5



CITY OF TORONTO
TRANSPORTATION OF HAZARDOUS
GOODS BY RAIL

LEGEND

SELECTED SITES FOR
HAZARD IMPACT ASSESSMENT



SOURCE: C.N. RAIL AND C.P. RAIL

Medium Consequence Zone (MCZ) The MCZ represents basically a 1000 m distance from the tracks with adjustments for special topographical features. This zone represents essentially the probable limit of significant impact of any type of DC accident. Figures 2.6 and 2.7 depict the extent of the HCZ and MCZ in Toronto. Table 2.11 provides statistics on demographic and other features within the HCZ and MCZ.

2.6.1 - Rosedale/Moore Park Area - North Toronto Subdivision

This is a residential area with a population of about 8000 located north and south of the CP North Toronto Subdivision, which has a very narrow right-of-way through this area. This line runs just south of the escarpment which provides a protective height of land to the Moore Park area north of the line. Population densities and road patterns would permit adequate evacuation of the HCZ, located largely south of the railway tracks. Both north and south areas are bordered by ravines which result in some constraints for evacuating the MCZ as a result of the limited number of entry points, i.e. Glen Road bridge, Roxborough Drive, Governor's Bridge, Whitehall Road, Moore Ave, Mount Pleasant Road north, St. Clair Ave. Housing largely consists of two-story residences on standard lots with considerable shrub and tree cover.

The rail right-of-way through this area is approximately 70 ft wide, indicating in many cases residential buildings within 50 ft of the tracks. It is estimated that the high consequence zone, approximately 500 m wide would contain:

resident population	- 2080 persons
daytime population	- 640 persons
nighttime population	- 1850 persons.

The total high and medium consequence zones for this stretch are estimated to contain:

Figure 2.6

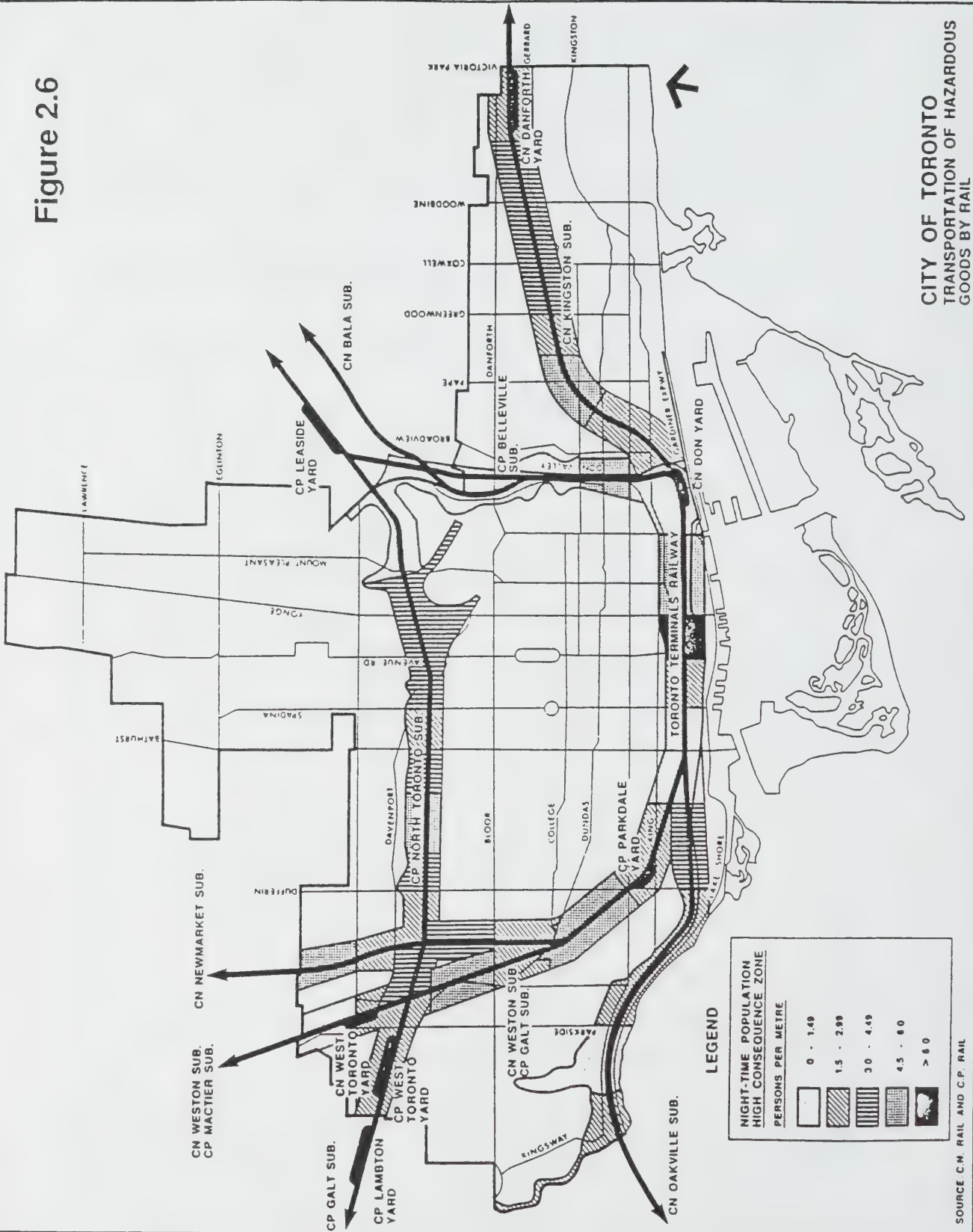


TABLE 2.11

SUMMARY OF POPULATION, EMPLOYMENT AND TOPOGRAPHIC DATA FOR THE ACCIDENT CONSEQUENCE ZONES, BY RAILWAY SUBDIVISION

STATISTIC	ZONE	KINGSTON	BALA/ BELLEVILLE	OAKVILLE	NEW- MARKET	GALT/ WESTON/ MACTIER	GALT/ NORTH TORONTO	TTR	(TTR-2001)* ALL SUBS.	PORTION IN YORK OR EAST YORK	CITY OF TORONTO	% OF CITY
POPULATION	-HCZ	21 363	4 102	7 222	13 884	20 213	31 333	4 657	(16 492)	97 427 (1 185)	606 247	15.9%
	-MCZ	93 322	32 455	38 958	63 304	111 581	122 244	15 959	(31 185)	338 783 (14 143)	606 247	53.5%
EMPLOYMENT	-HCZ	9 497	2 750	8 177	7 315	14 558	16 849	39 460	(75 129)	88 815 (900)	508 788	17.3%
	-MCZ	19 629	12 073	19 839	19 196	40 164	45 069	168 288	(213 613)	266 886 (1 973)	508 788	52.1%
SCHOOLS	-HCZ	4 329	0	0	2 238	3 944	7 252	420	(570)	9 681 n/a	97 326	9.9%
	-MCZ	20 255	5 865	3 234	14 615	16 395	22 001	2 182	(2 332)	56 130 n/a	97 326	56.1%
HOSPITALS/ NURSING HOMES	-HCZ	0	0	813	0	608	134	0	(0)	1 573 -	-	-
	-MCZ	1 135	784	2 052	48	1 364	1 258	697	(697)	5 364 -	-	-
OTHER SPECIAL POPULATIONS	-HCZ	0	0	0	0	0	5 333 (Police)	0	(0)	5 333 -	-	-
	-MCZ	500 (Jail)	500 (Jail)	0	0	0	5 333 (Police)	0	(0)	5 833 -	-	-
DAYTIME POPULATION	-HCZ	16 434	2 881	7 780	10 792	18 837	27 520	26 156	(51 080)	101 089 (896)	644 473	15.5%
	-MCZ	59 767	24 129	28 771	45 172	75 333	87 155	110 053	(141 316)	327 279 (5 427)	644 473	49.9%
NIGHTTIME POPULATION	-HCZ	21 098	4 242	9 244	13 183	21 711	31 675	14 496	(32 682)	109 602 (1 247)	647 380	16.7%
	-MCZ	89 550	32 909	41 380	59 861	109 822	121 068	54 360	(76 838)	369 591 (13 172)	647 380	55.1%
SUBDIVISION LENGTH IN METRES		6 732m	4 332m	6 420m	4 152m	7 740m	10 512m	4 452m	-	44 340m (768m)		
PERSONS PER METRE												
DAYTIME	-HCZ	2.44	0.67	1.21	2.60	2.44	2.66	5.88	(11.47)	2.50		
	-MCZ	8.87	5.69	4.48	10.87	9.73	8.48	24.72	(31.74)	9.75		
NIGHTTIME	-HCZ	3.13	0.98	1.44	3.18	2.81	3.11	3.26	(7.34)	2.63		
	-MCZ	13.30	7.88	6.55	14.42	14.19	11.93	12.21	(17.25)	11.60		
TOPOGRAPHIC FEATURES BY PERCENT OF LENGTH												
CATCHMENT BASIN	10%	-	-	28%	-	-	53%	84%	-	26%		
PROTECTIVE ESCARPMENT	-	68%	57%	-	-	-	67%	-	-	31%		

* Projection based on Railway Lands Development Plan.

Source: Municipal records.

resident population - 7940 persons
daytime population - 2430 persons
nighttime population - 7140 persons.

The population is divided between the areas separated by the rail corridor with about 40% to the north and 60% to the south. The northerly areas would be protected from the more confined hazards by the escarpment extending some 50 ft above the tracks, while the southern zone sits well below the railway embankment.

The likely effects of the various hazard incidents are discussed below reflecting the effect of an adjacent rail accident with rupture involving tank car or cars carrying propane or chlorine. The hazard areas discussed in Section 3 above assumed a relatively flat, unimpeded area and can be modified by the specific urban environs in the following descriptions.

(a) - Torch Fire

This constitutes a giant blow torch effect with typically a 20 foot flame which would not be expected to pose a serious threat to the adjacent community.

(b) - Pool Fire

It is expected that pool fires would be more serious in the lower temperatures experienced in winter as a result of the likely larger deposits of liquid occurring from a release. An un-ignited pool would be expected to disperse along the south side of the rail right-of-way and run along the north-south streets. Upon ignition this could affect an area larger than the standard given (i.e. 600 ft radius) because of fragmentation along the roads, affecting a resident population of up to 700 persons. The

following comments indicate the expected events occurring after ignition:

"Shielding afforded by housing, vegetation (different for winter and summer) and vehicles, influence the actual incident fluxes within each bounded area and hence the exposure time, the number of both injuries and fatalities and the amount of property damage. However, secondary fires will most likely erupt from cellulosic bearing shields (i.e. trees, fences, etc) less than 15 ft from the pool fire.

Faced with the real situation, panic-stricken people will not think to shield themselves, but will try to move away from the fire as quickly as possible. Radiant heat fluxes will strike their largely unexposed (clothed) backs. Under these circumstances, exposure time will increase but effective thermal fluxes will decrease with radial distance from the fire."⁶

The above reflects the conditions of a hazard scenario accompanying a pool fire. The high proximity and density of homes in this area would heighten exposure to the spreading conditions of a pool fire. Considerable injuries and property damage plus fatalities would be expected. Fire damage could extend to adjacent neighborhoods.

Nighttime populations would be higher but would be generally protected from the severe radiation temperatures of the initial ignition (with a very short burn duration) but would be exposed to expected subsequent burning of structures. Weekend daytime conditions in warm season could be hazardous considering the number of outdoor population and likely burning of trees and shrubbery.

(c) - Vapor Fire

A vapor or flash fire refers to the dispersion and ignition of a heavy gas cloud (e.g. propane). The extent of lethal zone under

ideal conditions is estimated by Raj as an area of 0.38 km (1180 ft radius), an area four times the extent of the pool fire impact.

The implications of this form of incident is described as follows in the paper by Klement and Napier⁶:

"Under ideal topographical conditions the discharged vapor would initially form into a hemispherical cloud and become more pancake-shaped as dispersion causes the diameter to increase.

The movement of propane vapors to the north would be blocked by the escarpment. It is important to note that the mixture would be flammable up to the base of the hill.

Dispersion to the south would be hindered by the obstacles present (houses and trees). The vapors would flow around these 'blocks' seeping into the basements of some houses and collecting in any depressions. The point concentrations of the cloud would be routinely changing from place to place as the material disperses through the residential area. Pockets of flammable mixtures would collect in several areas, possibly remaining there for a long time. Cloud movement to the south would be slow and restricted but not stopped. This is important to note when considering the time it would take for the area to be cleared of any vapor after the release.

Dispersion would in general parallel the escarpment. Cloud movement would follow the railway corridor to the east and west. The cloud would become cigar shaped as it moved along the paths of least resistance. At the base of the hill the mixture would remain flammable for a long period as the cloud elongates and disperses at the edges to the east and west as well as to the south, although to a lesser degree. The cloud centre will not displace to any extent. Dispersion of the vapors would take a long time and would be greatly assisted by an east-west wind."⁶

Ignition could occur as a result of several causes:

- electrical discharge,
- friction sparks,
- hot surfaces,
- flames,
- hot gas jets.

The resulting conflagration would undoubtedly have a similar effect as a pool fire over a much larger area--possibly affecting up to 2000 of the resident population, and with endangering fires over half the area of the medium hazard zone.

(d) - Vapor Cloud Explosion

As a result of an LPG leak from a tank car, a freely dispersed vapor cloud can form. Under certain wind conditions this cloud could rise above houses and trees, otherwise it could infiltrate the adjacent neighborhoods. The hazard area of a 3600 ft radius, referred to in Section 2.5 above, is based upon an unconfined, windless condition. It could be expected that prevailing conditions in the subjected area would constrain the cloud one way or another, and the impact area could be one-third to one-half the standard of a 3600 ft radius. This might be expected to encompass a hazard area (lethal zone) of up to half the total area of the consequence zones. This in turn could affect some 2500 to 3500 of the resident population.

In the case of this type of accident, heat radiation would be the main cause of death and injury. Depending upon the season and time of day, many of these persons would be protected from radiation effects if indoors. In any event, it would be a disaster of significance proportions resulting in much death and destruction.

(e) - BLEVE

BLEVE is a term that has become notorious in the field of hazardous incidents over the past few years and the extent of their explosions have become familiar. Their probability, given a release, according to Raj and Glickman is over eight times as great as that of a Vapor Cloud Explosions, but is still a highly improbable event. The BLEVE explosion creates a fireball at ground level which rises slowly into the sky. As with a Vapor Cloud Explosion, a BLEVE would have severe impacts at the higher levels. For example, according to Klement and Napier the radiant heat flux at the top of the escarpment would be at life-threatening levels and therefore the escarpment would not have the protecting effect as in the case of low level events (e.g. pool or vapor fires). It should be noted that two elementary schools are located above and in close proximity to the escarpment. Raj and Glickman indicate a hazard area similar to that of a pool fire, thereby threatening a resident population of about 700. BLEVE burn duration is estimated at 12 seconds, a long period for high burning flux (temperature) levels.

(f) - Release of Toxic Gas

For the calculations of impacted area, the release of a chlorine-filled tank car following a shell or head puncture is assumed. Since chlorine is a highly toxic gas, a lethal hazard area of 1.2 km² (2000 ft radius) is estimated by Raj and Glickman. The same conditions of distribution would be expected as described above for a vapor fire. With the constraints of the escarpment and the Mount Pleasant ravine, the bulk of the discharged gas would be expected to extend throughout much of both the high and medium consequence zones, thus threatening up to 4700 persons in the resident population. It should be noted that vehicles with

SECTION 3

DANGEROUS GOODS RAIL RISK

Outcomes may comprise a broad range, from death occurring instantly (or effectively so); to delayed death (e.g., from sub-lethal health effects, such as lung or eye irritation; to non-health related nuisances, such as odour or soiling; to psychological effects, such as uncertainty or dread; to impairment of the environment; or finally, to economic effects, such as modified real estate values or expenditures to clean up spills.

— Concord Scientific Corporation and IBI
Group
Risk Management, The Toronto Area Rail
Transportation of Dangerous Goods Task
Force – 1988

THE TORONTO AREA RAIL TRANSPORTATION OF DANGEROUS GOODS TASK FORCE

CONSULTANT'S REPORT

PUBLIC PERCEPTION
SURVEY

ROUTES

RISK ASSESSMENT

RISK MANAGEMENT

SPEED

TECHNOLOGY & SAFETY
ADMINISTRATION

BUFFERS

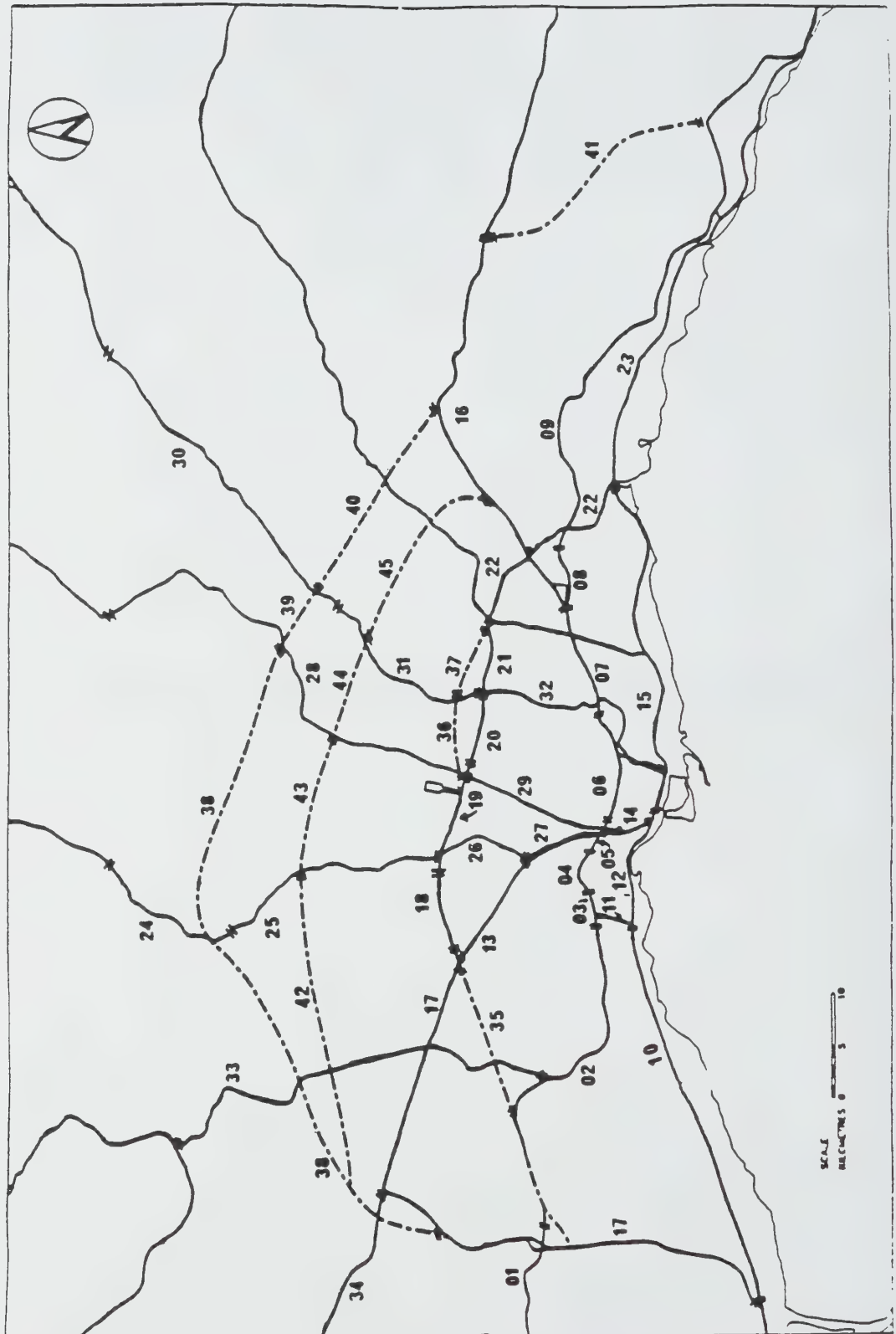
LAND USE

EMERGENCY RESPONSE

CONCORD SCIENTIFIC CORPORATION
AND IBI GROUP

Canada

EXHIBIT 3.11
UNIFORM ACCIDENT ENVIRONMENT SEGMENTS



Frequencies, Consequences and Societal Risk Rate for Hazardous Events

Existing Network
 C.P. Toronto
 North Subdivision
 ALTERNATIVE A1, SEGMENT 06, 1991

CHEMICAL	HAZARD	RELEASE RATE	HAZARD FREQUENCY (EVENTS/(YR.KM))	AVERAGE FATALITIES (FAT/EVENT)	MAXIMUM FATALITIES (FAT/EVENT)	MINIMUM FATALITIES (FAT/EVENT)	SOCIETAL RISK RATE (FAT/(YR.KM))
AMMONIA	TOXIC PLUME	LRR/NEF	1.51E-08 *	66	122	29	1.00E-06
		LRR/WEF	1.29E-07	74	133	16	9.50E-06
		SRR/WEF	9.60E-07	1	2	0	7.97E-07
CHLORINE	TOXIC PLUME	SRR/NEF	6.19E-05	6	6	5	3.42E-04
		LRR/NEF	1.75E-07	1200	3220	180	2.10E-04
		LRR/WEF	1.50E-06	2833	11300	138	4.25E-03
		SRR/WEF	1.12E-05	20	45	2	2.19E-04
EXPLOSIVE GASOLINE	BLAST WAVE JET FIRE POOL FIRE	SRR/NEF	1.13E-04	56	64	50	6.31E-03
		LRR/(WEF&NEF)	1.96E-09	68	68	68	1.34E-07
		SRR/(WEF&NEF)	1.77E-04	54	54	54	9.53E-03
		SRR	5.01E-05	91	91	91	4.57E-03
OLEUM	TOXIC PLUME	LRR	1.84E-05	147	147	147	2.71E-03
		LRR	2.64E-06	39	93	7	1.02E-04
		SRR/WEF	2.60E-05	0	0	0	2.50E-06
PHOSPHOROUS	TOXIC PLUME	SRR	1.04E-04	14	34	1	1.45E-03
		LRR	1.07E-07	20	50	1	2.14E-06
PROPANE	FLASH FIRE	SRR	3.76E-05	3	7	1	1.09E-04
		LRR	3.57E-08	20	26	9	7.13E-07
		SRR/(WEF&NEF)	1.36E-04	54	54	54	7.32E-03
		LRR/NEF	1.83E-07	1011	1010	1010	1.85E-04
		LRR&SRR/WEF	5.32E-06	508	508	508	2.70E-03
TOTAL							0.0401

NOTE:

* "E-08" means " x 10⁻⁸"

LRR/NEF - Large release rate / no external fire present

LRR/WEF - Large release rate / external fire present

SRR/NEF - Small release rate / no external fire present

SRR/WEF - Small release rate / external fire present

EXHIBIT 4-6

SYSTEM RISK TABLE : Alternative A1 for 1991

Segment	Subdivision	Length (km)	Societal Risk For Segment (Fatalities/ Year)	Societal Risk Rate Along Segment (Fatalities/ Year·km)
A1-01	CP Galt	15.6	0.0464	0.0030
A1-02	CP Galt	34.5	0.1707	0.0049
A1-03	CP Galt	2.4	0.0300	0.0125
A1-04	CP Galt	3.9	0.0675	0.0173
A1-05	CP Galt\N. Toronto	3.0	0.2341	0.0780
A1-06	CP N. Toronto	9.1	0.3642	0.0400
A1-07	CP Belleville	12.5	0.1793	0.0143
A1-08	CP Belleville	4.6	0.0259	0.0056
A1-09	CP Belleville	64.3	0.1026	0.0016
A1-10	CN Oakville	38.0	0.1180	0.0031
A1-11	CP Canpa	4.2	0.0110	0.0026
A1-12	CN Oakville	13.4	0.0201	0.0015
A1-13	CN Weston	9.4	0.0004	0.000043
A1-14	CN Weston	5.7	0.0282	0.0049
A1-15	CN Kingston	32.6	0.0055	0.00017
A1-16	CP Havelock	42.8	0.0007	0.000017
A1-17	CN Halton	65.6	0.3848	0.0059
A1-18	CN Halton	7.6	0.0646	0.0085
A1-19	CN Halton\York	9.0	0.0208	0.0023
A1-20	CN York	7.3	0.1947	0.0267
A1-21	CN York	8.0	0.0435	0.0054
A1-22	CN York	23.4	0.0050	0.00021
A1-23	CN Kingston	52.5	0.1061	0.0020
A1-24	CP MacTier	16.4	0.0060	0.00036
A1-25	CP MacTier	17.8	0.0095	0.00053
A1-26	CP MacTier	9.2	0.0179	0.0020
A1-27	CP MacTier\CN Weston	7.1	0.1448	0.0204
A1-28	CN Newmarket	44.6	0.0131	0.00029
A1-29	CN Newmarket	14.2	0.0589	0.0041
A1-30	CN Bala	21.3	0.0141	0.00066
A1-31	CN Bala	62.0	0.0462	0.00075
A1-32	CN Bala	22.9	0.0589	0.0026
A1-33	CP Owen Sound	57.9	0.0001	0.000003
A1-34	CN Guelph	13.5	0.0005	0.000037
Yards				
A1-Y1	CN MacMillan		0.6776	
A1-Y2	CN Mimico		0.0015	
A1-Y3	CN Don		0.0059	
A1-Y4	CP Agincourt		0.0931	
A1-Y5	CP Lambton		0.6068	
A1-Y6	CP Obico		0.0045	
A1-Y7	CP Ray Ave		0.0917	

Total Societal Risk for Toronto Area Rail System

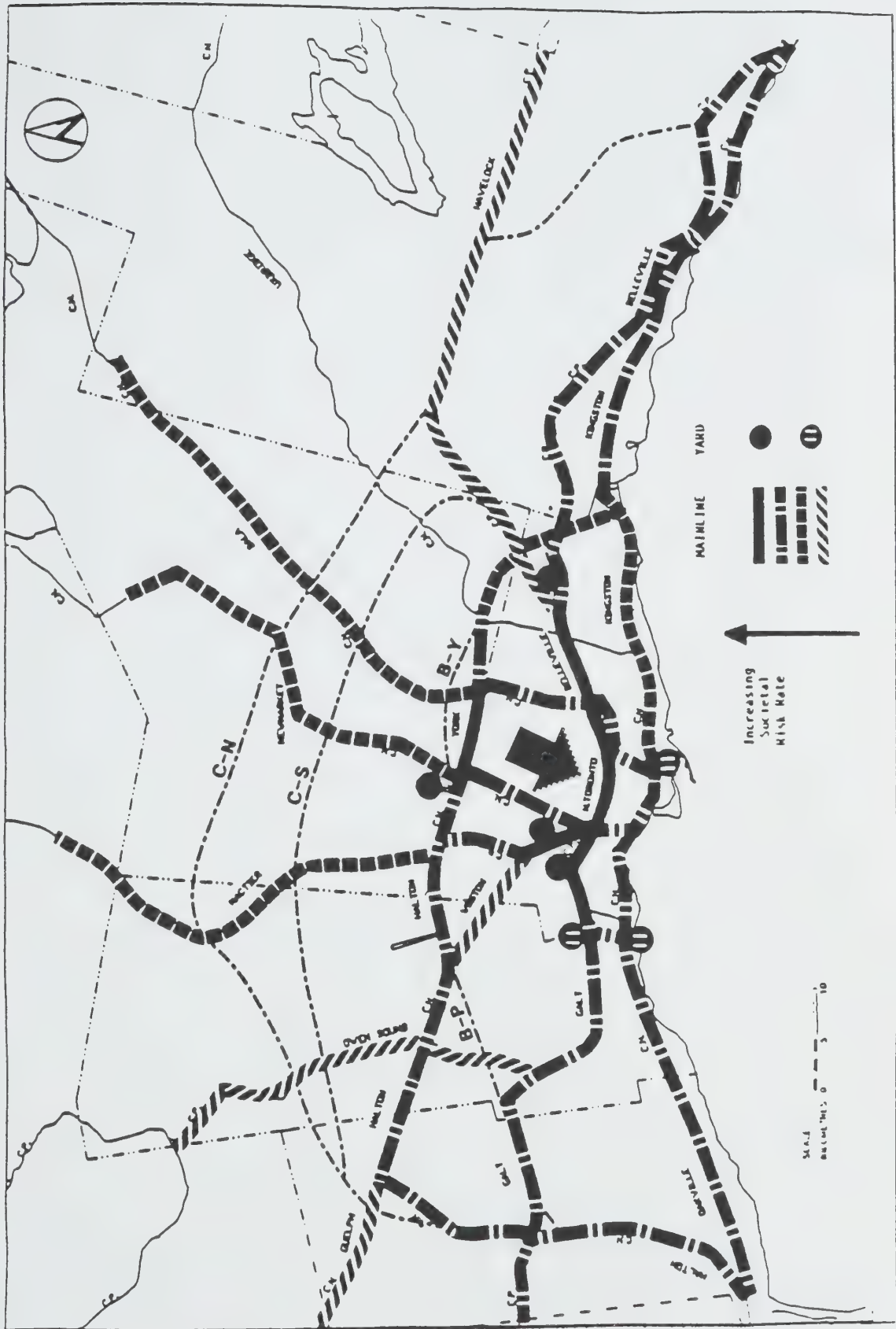
= Sum of Societal Risks for all Segments =

4.1

Fatalities/Year

EXHIBIT 4-7

Societal Risk Distribution in the Toronto Area for
 DG Rail Transport Routes in the Existing System



SECTION 4

UNACCEPTABLE RISK

.. in Europe some countries consider individual risk levels greater than one in a million to be unacceptable,...

— Concord Scientific Corporation and IBI
Group
Risk Management, The Toronto Area Rail
Transportation of Dangerous Goods Task
Force – 1988

the ratio of the maximum and minimum values of societal risk rates for the rail segments comprising the various system alternatives is presented in Exhibit 9. The ratios are shown for the years 1991, 2011 and the average of those two years. A sample explanation or illustration of the ratio values is given in the exhibit, indicating that, for example, for the existing system (alternative A1) the maximum risk level, which is along segment 5, is 26,000 times higher than the minimum risk level, along segment 33. Segment 5 is a high volume dangerous goods rail segment along the highly populated CP Galt - North Toronto subdivision and segment 33 is a low volume dangerous goods segment along the CP Owen Sound subdivision with relatively low population density.

In general, Exhibit 9 shows that there is a rather substantial spread between the minimum and maximum risk levels along rail segments. This is primarily a function of the volume of dangerous goods transported and the population densities along these segments. The averages for the 1991 and 2011 estimates indicate that, relative to the existing system, the spread between the maximum and minimum risk levels can be reduced by a factor of about 2 for alternatives A2 and B2A, a factor of about 2.5 for alternative B2B, and a factor of about 5.5 for alternatives C1 and C3. The max/min ratio can be viewed as a rough measure of how effectively the various alternatives "spread out the societal risk" based upon population projections to the year 2011.

To this point, we have examined societal risk for the overall system and the rail segments which comprise the system. It should be noted that, whether or not the estimated baseline societal risk of 4 statistical fatalities per year for the overall system is considered acceptable, there may be rail segments within the system for which the societal risk levels may be deemed to be unacceptable. The appraisal of the acceptability of risk along rail segments should also include consideration of individual risk levels.

Exhibit 10 presents the individual risk profile for a typical high-volume dangerous goods rail transport segment in the greater Toronto area, such as the CP North Toronto line, in relation to other individual risks in Canada. Individual risk decreases with increasing distance from the rail line as one would expect. This exhibit does indicate that close to the rail line there are relatively high estimated levels of individual risk. At distances beyond about 400 meters from the rail line, individual risk drops off to below one in a million, a level below which there is generally little or no concern. For example, in Europe some countries consider individual risk levels greater than one in a million to be unacceptable, and, where multiple fatalities are possible, individual risk levels above one in ten million are considered

EXHIBIT 9

RATIO OF MAXIMUM AND MINIMUM VALUES OF
SOCIETAL RISK RATES FOR THE RAIL SEGMENTS
COMPRISING VARIOUS SYSTEM ALTERNATIVES

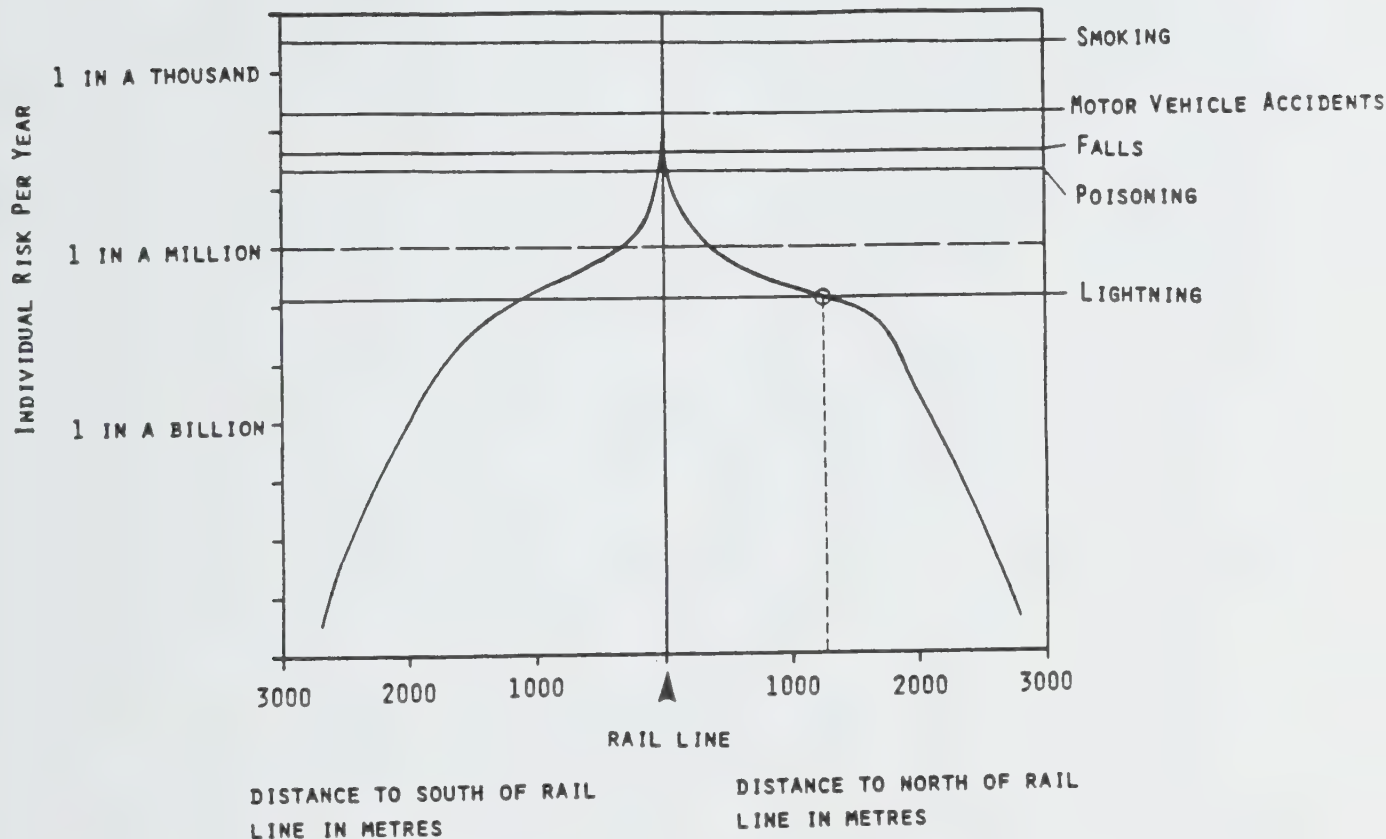
<u>YEAR</u>	<u>ALTERNATIVE*</u>					
	A1	A2	B2A	B2B	C1	C3
1991	26000	12000	13000	12000	4600	4600
2011	19000	10000	9000	6000	3500	3500
Average	23000	11000	11000	9000	4100	4100

Sample explanation: For alternative A1 (the existing system) for the year 1991, the maximum societal risk rate in fatalities per km per year is estimated at 0.078 along rail segment 5 (CP Galt/North Toronto subdivision) and the minimum at 0.000003 for segment 33 (CP Owen Sound subdivision). Therefore, the ratio of maximum and minimum risk rate values is $0.078 \div 0.000003 = 26000$. This means that the estimated societal risk per kilometer of track is 26,000 times higher along segment 5 than along segment 33 in the existing system. (Please refer to the risk assessment report for the detailed data on societal risk rate by segment).

*Only data for the alternatives for which detailed risk analyses were completed are available.

EXHIBIT 10

INDIVIDUAL RISK* PROFILE FOR A HIGH VOLUME D6 RAIL
TRANSPORT SEGMENT IN THE GREATER TORONTO AREA
IN RELATION TO OTHER INDIVIDUAL RISKS IN CANADA



*THIS IS THE RISK (LIKELIHOOD) PER YEAR THAT AN INDIVIDUAL LIVING AT SOME DISTANCE FROM THE RAIL LINE WOULD BE KILLED AS A RESULT OF A D6 RAIL ACCIDENT.

SAMPLE INTERPRETATION: IF A PERSON LIVED ABOUT 1 KM (1000 METRES) NORTH OF THE RAIL LINE, THE RISK OF BEING KILLED AS A RESULT OF A D6 ACCIDENT IS ABOUT THE SAME AS THE RISK OF BEING STRUCK AND KILLED BY LIGHTNING (I.E. ABOUT 1 CHANCE IN 8.3 MILLION).

unacceptable (Chicken, 1986). Therefore, on the basis of individual risk close to high volume dangerous goods rail transport segments, there may be grounds for considering measures which could reduce these relatively high individual risk levels. However, before making any judgements as to the acceptability of the risks near a rail line, the uncertainties in the risk estimates must be considered, since for such judgements one must be concerned more about absolute risk than relative risk, which has been the focus of the present study. These uncertainties are addressed in Section 3.4.

Further examination of Exhibit 10 reveals the potential risk reduction benefits that could be derived from adopting buffers. For example, a buffer of 50 meters on either side of the track would reduce the individual risk for the particular case shown (a high volume DG rail segment) by about a factor of 10 over individual risk right at the rail line. To reduce the risk by another factor of 10, (that is, to one in a million), would require a buffer of 400 meters on either side of the track. It should be noted that Exhibit 10 was derived for high volume dangerous goods transport segments, which result in the highest levels of individual risk as compared to lower volume DG rail transport segments, which if located in highly populated areas contribute significantly to the levels of societal risk. Therefore, if an objective were to reduce individual risk levels to below the one in a million level as discussed above, for the high volume DG lines, buffer zones on either side of the rail line of about 400 meters, where feasible, would achieve the objective. The buffer consultants report indicates that the updating of the Regina Development Plan (Official Plan) has provided for a restricted development corridor 2000 ft (~600 m) in width centred on the planned route of a railway intended to be relocated. No residential development is allowed in the 2000 ft (~600 m) wide corridor. Residential densities would be graduated to increase beyond the width of the corridor. The corridor was recognized by the Emergency Measures Organization as being of sufficient size to mitigate risk from dangerous goods accidents. In Edmonton they noted that the Alberta government had provided a multi-use utility and transportation corridor one-half mile wide (~800 m) encircling the city and had purchased approximately 60% of the area needed. It's use to mitigate risk from dangerous spills from future facilities had not been contemplated.

3.2 Risk Reduction Versus Costs

In this section, we deal with the economic costs which have been assessed in the alternative routes and operating strategies report, and these are analysed here in relation to potential risk reductions, as estimated in the risk assessment report. A useful way of examining the costs of risk reduction alternatives is to look at a plot of the risks of the alter-

SECTION 5

EVACUATION

If the chemical spill requires a large-scale evacuation response in, say 30 to 40 minutes, than heaven help those involved. There is not a hope in hell of getting them out.

— Sam Cass
Former Roads and Traffic Commissioner
of Metropolitan Toronto; Railway Transport
Committee Hearing – January 1981

THE TORONTO AREA RAIL TRANSPORTATION OF DANGEROUS GOODS TASK FORCE

CONSULTANT'S REPORT

PUBLIC PERCEPTION
SURVEY

ROUTES

RISK ASSESSMENT

RISK MANAGEMENT

SPEED

TECHNOLOGY & SAFETY
ADMINISTRATION

BUFFERS

LAND USE

EMERGENCY RESPONSE

South of Davenport Rd. the study area slopes gently to the south, therefore having little effect during an emergency. An escarpment running roughly parallel to Davenport may force the containment of heavy toxic gases and liquids or debris from explosions within the low-lying area, thus shielding the residential area north of Davenport.

6.2.3 NORTH TORONTO SUBDIVISION

The North Toronto Subdivision study area is defined by a one kilometre zone enclosing the CP railway corridor between Yonge St. and Bayview Ave. The area is primarily residential with high density retail, commercial and residential development along the main corridors (Yonge St., St. Clair Ave., and Avenue Rd.). The eastern portion of the study area in the Don River Valley is largely open space.

The residential portions of the study area are highlighted by well-established older neighbourhoods, including the wealthy Rosedale area (large homes and lots) and the middle- to upper-class neighbourhoods of Moore Park, Leaside and the Annex. Generally smaller, denser homes are found near the tracks and/or close to the main thoroughways. Homes are within 50 feet of the tracks along Shaft Rd. and Summerhill Ave., with low rise apartments abutting railway land along Leacrest Rd. (little to no buffer). Low-rise (less than 10 storeys) apartment development is common along the main streets, with newer high-rise apartment development in the Yonge-St. Clair area, (where approximately 20 buildings are located), in the Yonge-Davenport area and along portions of Avenue Road. These densely populated areas may experience evacuation problems as a sudden large influx of people onto the roads may congest them. There is particular concern regarding the Belmont House Home for the Aged (Belmont and Davenport) and Fellowship Towers (a seniors residence at Yonge north of Severn), both high-rise developments possibly requiring significant and time-consuming ambulance assistance.

High-rise office development is very prevalent along St. Clair Ave., with low-rise office buildings found dispersed along Yonge St.. This creates a very high-density population during the day-time which is compounded by the large number of high-rise apartment dwellers in close proximity to the office towers. Evacuation of these areas could be very difficult and time-consuming; sheltering may be an option.

It is evident that, in general, very severe impacts would likely be felt by the very large number of residents, employees and tourists in the area and by the surrounding region which is served by the Toronto downtown area.

6.3.2 CITY OF TORONTO: DUPONT-DUFFERIN

The 15 kilometre plume extending from the Dufferin-Dupont intersection covers a densely populated, primarily residential area with office and retail development along the main roads and some industrial pockets. Affluent neighbourhoods are found within the study area in lower Forest Hill, Rosedale and the Annex. High weekday populations are located in the industrial areas found along Dupont St, in Leaside, Wexford, Oakridge and the Leslie/Eglinton area. Portions of the Spadina-University, Yonge and Bloor-Danforth subway lines run through the area as does the lower portions of the Don Valley Parkway. Therefore, the closure of these main transportation routes would strand a large number of people within the 15 kilometre plume. The deep valley of the Don River may reduce the impact on residents to the east as a heavy gas such as chlorine may concentrate in the valley and divert in a north-south direction along the river, if the wind from the west south-west is weak.

Given the dense residential areas, and the popular shopping and business districts within the zone, this area would likely be very severely impacted by a major chlorine disaster. The immobilization of the transportation system would further complicate the situation as a large number of evacuees would likely be trapped in the swath of the plume. One hospital, the Toronto East General is situated on the south border of the plume. Therefore it is possible that it would be unavailable to treat casualties.

6.3.3 NORTH TORONTO SUBDIVISION

A major chlorine gas incident in which gases dispersed in an east-north-east direction for 15 kilometres could have major ramifications on the impacted area. The chlorine plume would traverse primarily medium-density urban residential, commercial and industrial urban areas. High-density residential areas are found in the downtown area where row, semi-detached and detached housing is found on small lots, and apartment complexes are found dispersed along main thoroughways. Residential



density decreases in the Scarborough area. Industrial pockets include the Golden Mile, Oakridge, Knob Hill and Wexford areas and commercial areas include Thorncliffe Park, Eglinton Square and abundant commercial strip development on main roads. The area is primarily residential. Transportation routes could be severely hampered by a major chlorine accident as part of the Don Valley Parkway, the subway system and Go Train may be immobilized. The deep Don River Valley would likely act as a good buffer to areas to the east, as the heavy chlorine gas would accumulate in the valley and possibly follow the valley rather than continue dispersing to the east.

Toronto East General and Scarborough General Hospitals are found on the south and north borders of the plume, respectively. Therefore medical services may be severely hampered if these facilities are impacted.

6.3.4 CITY OF SCARBOROUGH: AGINCOURT MARSHALLING YARD

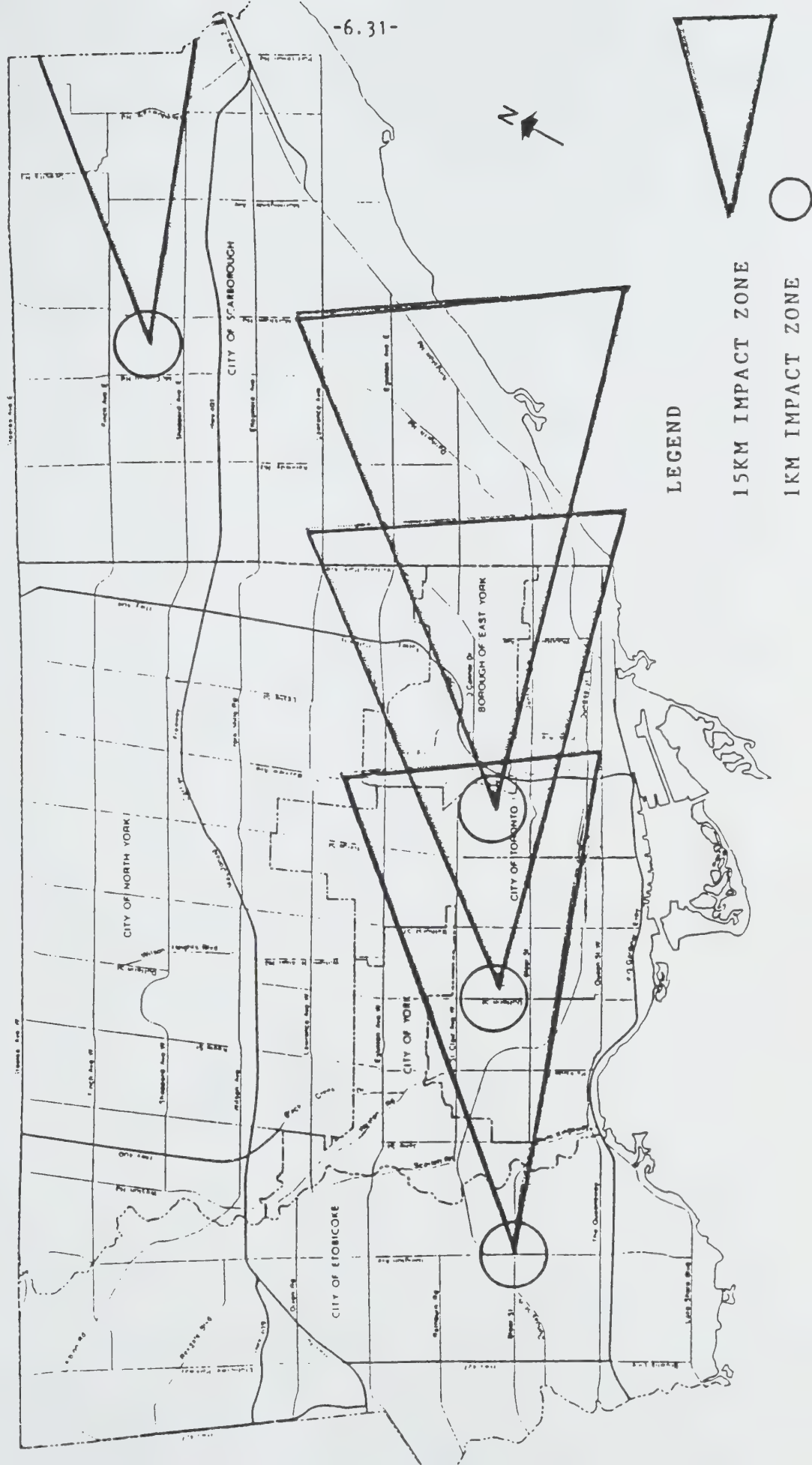
A chlorine plume would disperse over a variety of land uses from the Agincourt Marshalling Yards. Medium to low density suburban residential areas are found south of Finch Ave., west of Morningside Avenue and in the Town of Pickering. North of Finch Ave., west of Staines Rd., is an industrial area; east of Staines Rd., open space and parkland predominates. Therefore a substantial population would be impacted, both during the day when employees are working in the industrial areas and during the evening when community residents return home.

In low-lying areas in the Rouge River Valley, a concentration of the toxic material may accumulate to help buffer areas to the east. The Metro Toronto Zoo is situated within the cone, which poses significant concern regarding the potential loss of rare animals, and possible impacts on large groups of the public visiting this facility.

6.3.5 HAVELOCK SUBDIVISION

In the Havelock Subdivision, a major chlorine gas incident would disperse over a rural area composed primarily of farmland and open space (see Figure 6.5). Several small hamlets such as Mount Zion, Kinsale, Greenwood, and Brougham are found in the area as is the Claremont Conservation Area. The terrain is rolling with low-lying areas

FIGURE 6.8
IMPACT ZONES IN METROPOLITAN TORONTO



SECTION 6

THE KNOCK-ON EFFECT

...the consequences of non-dangerous goods, such as lumber or boxcars, can be just as dangerous in a derailment should these cars strike a hydro tower, hydro sub-station (where PCBs may be involved) or propane tank facilities near trackside;

- Metro Transportation Committee
Transportation of Dangerous Goods by
Rail within the Metropolitan Toronto Area
December 21, 1987

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: April 28, 1982

Forwarded to:

Mr. Paul Rodgers
Administrative Director
National Association of Regulatory
Utility Commissioners
1102 Interstate Commerce Commission Building
Washington, D.C. 20040

SAFETY RECOMMENDATION(S)

I-82-5

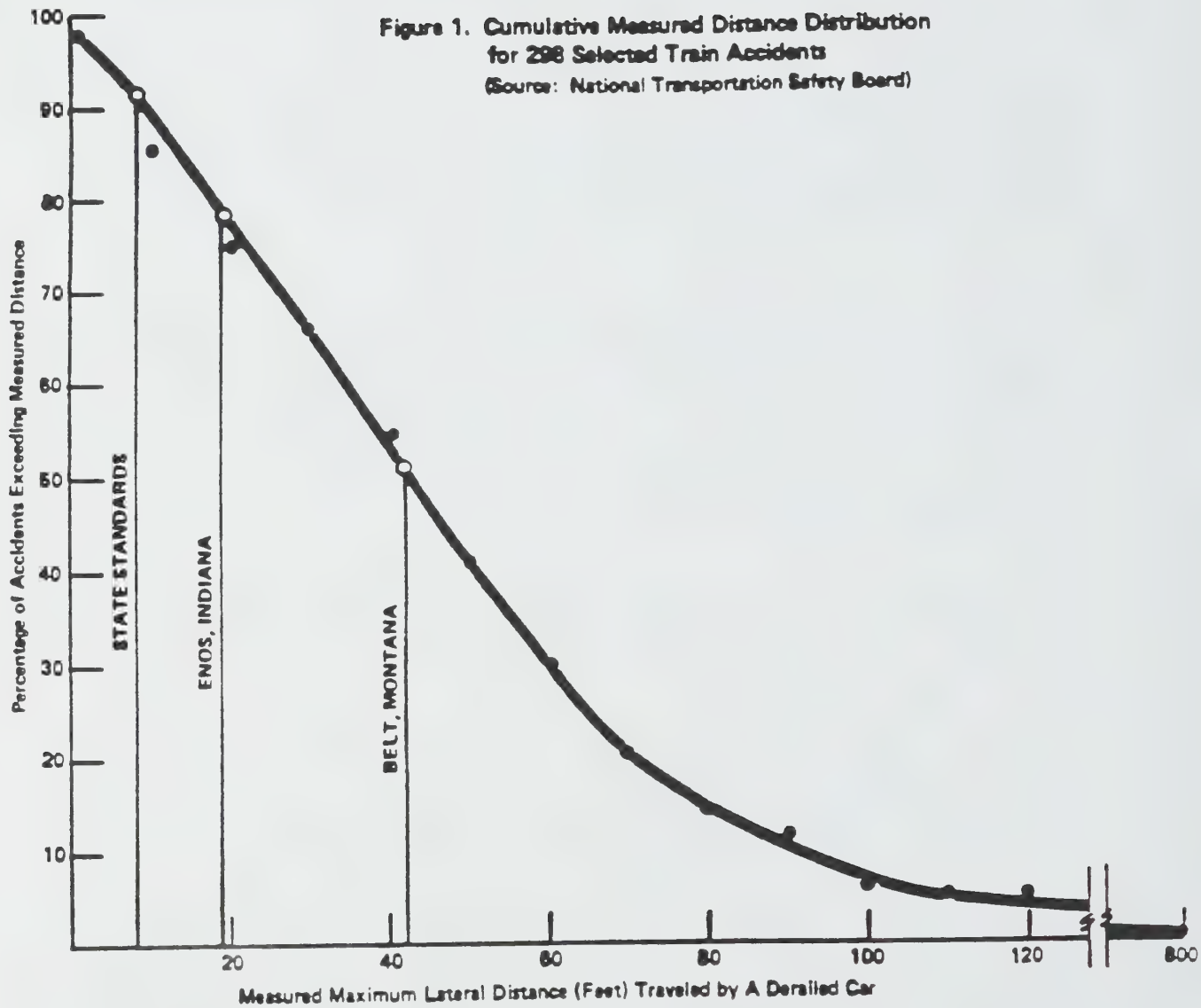
On March 25, 1981, at Enos, Indiana, a railroad flatcar which had derailed struck three of four 1,000-gallon farm truck tanks loaded with anhydrous ammonia parked near the mainline tracks. The flatcar breached two of the tanks, opening a tear in one tank and shearing off all of the valves from a second. Ammonia escaped and mixed with fog, drifted across a divided highway 1/4 mile away, obscured motorists' vision, and led to multiple motor vehicle crashes. As a result of the accident, the train conductor and a motorist died and the rear brakeman and two motorists were injured. The distance from the tanks to the track ranged from about 19 to 40 feet. The flatcar traveled 65 feet from the track before coming to rest.

On November 26, 1976, in Belt, Montana, one of a number of derailed railroad cars struck a 16,000-gallon gasoline storage tank; in the ensuing fire the entire bulk storage plant burned; 2 persons were killed and 24 others were injured as a result. ^{1/} The tank was located about 42 feet from the mainline track; several of the derailed cars traveled more than 100 feet from the track.

While the farm truck tanks and the storage tank at Enos and Belt were far enough away from the tracks to provide adequate clearance for normal train operations, they were not far enough away to prevent them from being struck by the derailed cars. No specific protection against damage by derailed cars was provided or required. At both Enos and Belt, the hazardous materials tanks were on property leased from the railroad.

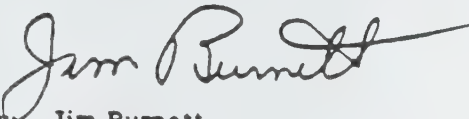
In both cases the hazardous materials tanks complied with regulations, codes, and contract requirements regarding minimum clearance and construction. The farm truck tanks involved in the Enos accident were built in accordance with the American Society of Mechanical Engineers Boiler and Pressure Code. The carrier's right-of-way boundary at Enos was 18 feet from the tracks; the tanks were at least 19 feet from the tracks, in compliance with the minimum clearance requirements of a 1963 contract between the carrier and the facility operator.

^{1/} "Railroad Accident Report: Derailment of a Burlington Northern Freight Train, Belt, Montana, November 26, 1976" (NTSB-RAR-77-7).



Reevaluate State statutes and administrative orders to identify action States might take to improve protection of hazardous materials storage near railroad right-of-way against damage by derailed railroad cars in train accidents, and develop guidelines for State actions if needed. (Class III, Longer Term Followup) (I-81-5)

BURNETT, Chairman, and McADAMS, GOLDMAN, and BURSLEY, Members, concurred in this recommendation.


By: Jim Burnett
Chairman



RICK EGLINTON/TORONTO STAR

\$300,000 DAMAGE IN FIRE AT CN RAIL YARD

A storage shed, two live-in trailers and two CN Rail boxcars in a rail yard at Dufferin and Alma Sts. lie in ruins after a fire yesterday that caused about \$300,000 damage. No one was injured and cause of the fire hasn't

been determined. The south half of the storage shed, which contained vegetables and melons, was undamaged. The gutted north end appeared to have held only furnishings, a fire official said.

Council wants to shift hazardous factories

BY PAUL TAYLOR
The Globe and Mail

In the wake of an explosion and chemical spill at a west-end Toronto factory this week, Toronto politicians are calling for certain industries to be moved well away from neighborhoods.

"This explosion has brought into focus a very serious problem," Alderman Anthony O'Donohue told City Council yesterday.

"Companies that produce hazardous goods should not be located next to residences. We should relocate them."

All of the council seemed to agree. Members unanimously passed a motion calling for a variety of reports on the possibility of moving factories that use or produce potentially hazardous materials.

The council agreed that the Nacan Products Ltd. plant, the site of the explosion, should remain closed until the safety of the workers can be assured. It called on the Ontario Ministry of Labor to use its power to check into the safety of the operations.

No one was hurt in Tuesday night's explosion, but nearby residents complained of irritated eyes, burning skin and labored breathing. A 30-metre-high cloud of toxic smoke rose from the

Wallace Street plant after the explosion left a gaping hole in the wall of the plant. Those living nearest to the plant were taken to hospital as a precautionary measure.

After the mishap, John Shephard, vice-president of Nacan, said a valve on a tank inside the plant was left open, allowing vinyl acetate to leak into several hundred litres of a mild solution of nitric acid and causing the explosion.

The vinyl acetate and the nitric acid are used in a combination to clean mixing tanks. Both chemicals are volatile and can irritate skin and lungs.

During yesterday's council meeting, one member after another expressed horror that some future industrial accident could cause a huge loss of life in a neighborhood.

"People have a right to demand better (industrial) controls," said Alderman William Boytchuk.

Councillor Joe Pantalone insisted that previous industrial accidents provide sufficient justification for the relocation of certain industries.

"There are enough people getting injured in this province to fill Maple Leaf Gardens many times over — and it's not acceptable."

Toronto considers ban on dangerous factories

By Tom Kerr Toronto Star

Toronto City Council will consider banning potentially dangerous factories near residential areas.

Voting unanimously yesterday to study the possibility of a ban, council reacted quickly to fear created by a chemical explosion in the west-end Junction neighborhood this week.

It also ordered a full-scale probe of the explosion at the Nacan Products Ltd. glue factory and said the plant should remain closed until the province is satisfied the health and safety of employees are assured.

The explosion Tuesday at the Wallace St. plant produced a shower of yellowish rain in the Bloor St. W.-Dufferin St. area.

Seven children and two dozen adults were treated at hospital for sore throats, chest pains and burning sensations.

Saying a "curtain of fear" has descended on the area, Councillor Derwin Shea proposed a hard look at relocating dangerous industries. "I'm tired of hearing excuses and assurances that (such accidents) won't happen again," said Shea.

Alderman Bill Boytchuk, who also represents the area, said "people in Junction triangle have the right to demand better control and relocation of dangerous industries."

The neighborhood has a troubled history of industrial pollution, he said, and residents are not satisfied with safety measures.

SECTION 7

EMERGENCY & MAINTENANCE RIGHT-OF-WAY ACCESS

In Vaughan ... On all rail lines, there are routine daily events such as grass fires on the right-of-way, cars on fire because of overheated brake shoes, and overloaded tank cars that leak or may leak. These events are relatively frequent and if allowed to propagate or expand, the consequences could be disastrous.

— Mayor Lorna Jackson
Town of Vaughan
Address to The Toronto Area Rail Transportation of Dangerous Goods Rail Task Force – 1988

THE TORONTO AREA RAIL TRANSPORTATION OF DANGEROUS GOODS TASK FORCE

FINAL REPORT

information we were providing. At the same time there was a strong indication that they were quite unaware of what was occurring in their neighbourhoods or where they could go to get this data.

The constant demand from the public to be assured that “all that can be done, is being done” is nowhere more pertinent than it is in this area of emergency response. It is our view that the public have respect for, and confidence in their emergency response personnel and facilities, but that they are also quite unaware of the deficiencies which exist.

We conclude that good emergency response requires a well informed public capable of reacting in positive and decisive ways.

It is for this reason that we recommend that:

■ Emergency Plans, and simulation exercises, include a Public Awareness and Education component through the issuance of information brochures, pamphlets and pertinent emergency response data.

Lack of Emergency Response Access to Rail lines

The Town of Vaughan's Fire Chief told us that access to rail lines through residential developments in his jurisdiction was extremely difficult. With the use of slides and maps, he indicated that housing was built so close together that he was not able to get his response vehicles between them. Hoses and response equipment would have to be hand carried into backyards, up berms with steep slopes, and over eight foot walls. Even after this exercise, the water supply would be inadequate to cope with a major rail disaster.

We toured several developments in the Greater Toronto Area and saw similar examples of restricted access to rail lines. Our consultants also found that access to rail lines is a problem, and would be next to impossible to rectify. They suggested that access should be a requirement on any newly constructed line, and we agree.

We recognize that there is a potential conflict between ease of access for emergency response and the potential for unsafe trespass by the general public onto railway property.

We nevertheless recommend that:

■ All Levels of Government, but particularly the Provincial and Municipal Governments, and the railway industry ensure full and adequate access to all parts of a railway line

carrying dangerous goods in a densely populated urban area without encouraging unsafe trespass; and that

- Provincial and Municipal planning guidelines and practices ensure that adequate and sufficient emergency response requirements are addressed to cope with dangerous goods rail accidents in those areas where rail lines are located.

Lack of Consistency in Railway Emergency Response vis-a-vis Municipalities

Both railways have excellent emergency response capabilities and organizations. Emergency response telephone numbers are fully distributed to all first responders in the Greater Toronto Area and specialized, well trained staff occupy Operation Rooms on a 24 hour basis.

However there are some inconsistencies between the operations of the two railways, such as the way the consist listing is prepared. It is not our intention to pass judgement on how these inconsistencies should be resolved; but in the case of emergency response and in the case where public safety is involved, every effort should be undertaken to remove all obstacles to a quick and rapid emergency response. All ambiguities and areas for misinterpretation should be resolved.

We recommend therefore that:

- The railways standardize all their operations as it affects emergency response (i.e. consist documentation; emergency procedures; response team duties and responsibilities);
- The railways notify all first responder agencies in the Greater Toronto Area of these standard practices and procedures; and that
- The railways participate, with the Greater Toronto Area first responders, in simulation exercises, especially involving the rail flow of dangerous goods.

Evacuation Difficulties

Our consultants advised us that some communities have focused their entire emergency planning on a strategy of evacuation, but have not given enough thought to the resources and the organization needed to carry it out.

They also outlined the magnitude of a dangerous goods evacuation. We know the experience of the Mississauga



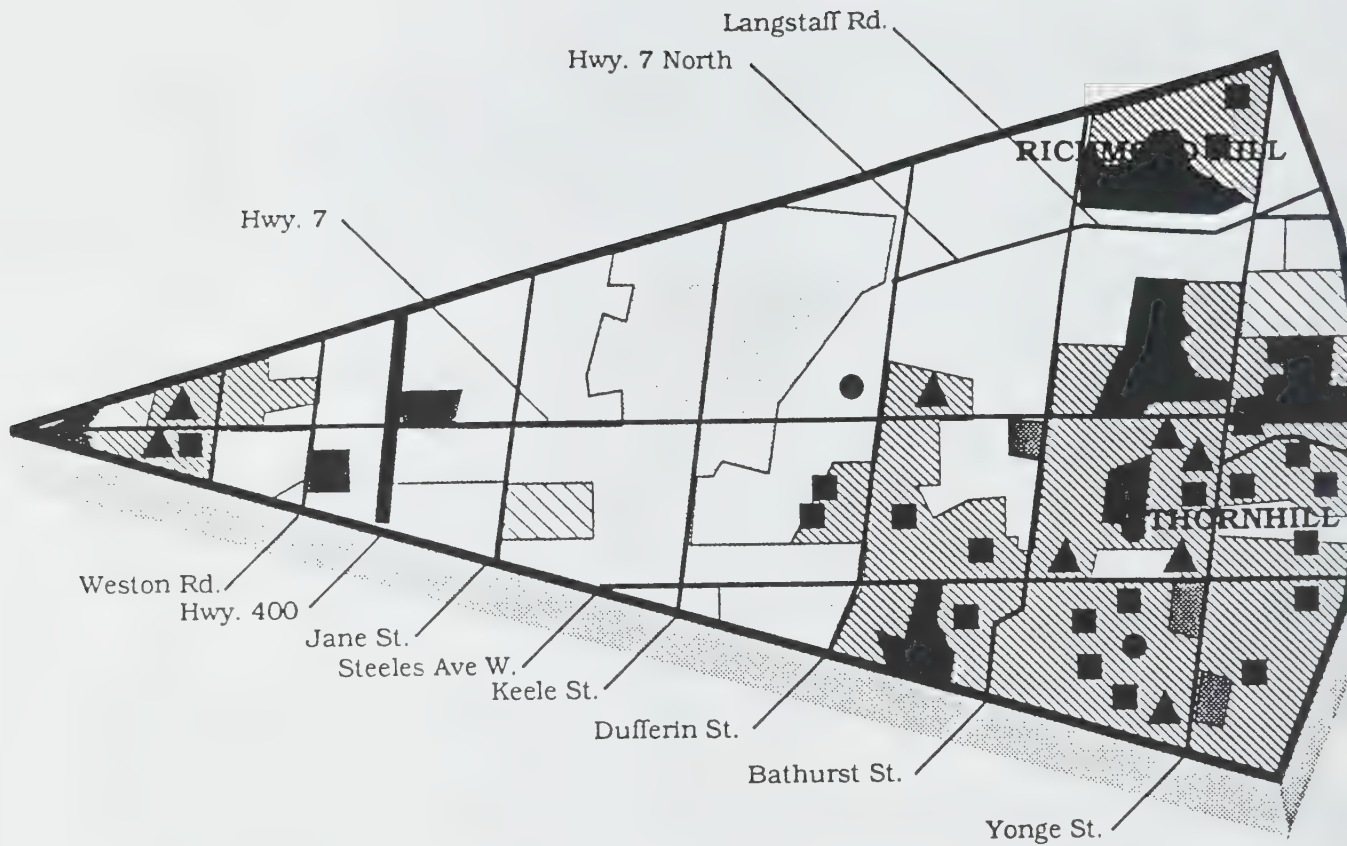


Exhibit 4.16
Woodbridge
15km Impact Zone
30° Plume from WSW

Commercial		Parkland	
Industrial		Residential	
Open Space		Cemetery	
School	Church	Community Facility (i.e. arena, pool)	

evacuation. We know the experience of the Mississauga evacuation of nearly a quarter of a million persons. Our consultants developed further, theoretical impact zones postulating the effects of a 15 kilometre chlorine plume occurring at various locations in the Greater Toronto Area.

An example of such a plume is shown in Exhibit 4.16 for an accident in the Woodbridge area, just north-west of the City of Toronto. If such an accident were to occur in the Bloor-Islington/Kipling area, or along the Canadian Pacific's

consultants expect that several major hospitals would have to be evacuated, thus reducing or eliminating some major emergency response facilities when they are needed the most.

During our tours of the Greater Toronto Area we witnessed the narrow and winding roadway systems - especially in the older parts of the cities. We saw schools, hospitals and senior citizens establishments located next to railway lines. We learned of the difficulties involved in first informing, then moving large numbers of people in a relatively short period of time.

The British Health and Safety Executive advised us that evacuation should not always be considered a viable alternative. They stressed that occasions may exist when it is safer to stay indoors and to close all doors and windows. This question, we believe, requires further clarification since in the Greater Toronto Area we continually heard of the need to address a full evacuation.

In discussions with such cities as San Antonio and Houston, Texas, we learned that many United States jurisdictions are concentrating resources on improving emergency response capabilities. Other countries are taking similar courses of action.

Evacuation in some locations of the Greater Toronto Area could only be undertaken with great difficulty. Successful evacuation can best be achieved through a fully informed and co-operative populace, guided and assisted by well trained and knowledgeable emergency response units. The recommendations previously made with regards to public information, emergency response capability and simulation exercises apply here as well.

Railway Demand on Emergency Capabilities

In his presentation to the Task Force, the Fire Chief of Vaughan indicated that his department responded to over 1300 calls at Canadian National's McMillan Yard in 1987. The majority of these calls were minor in nature, for such matters as grass fires, tank car leaks, and 'standing-by' during the transfer of dangerous goods. Regardless of the nature of the call, the demand was there and Vaughan's Fire Department responded.

The railways pay taxes like any other business enterprise, and these taxes go towards paying for fire protection. However, excessive demands may require some extra compensation. While the railways have developed an excellent

Hazardous Materials Rail Transport Risk Assessment and Risk Management Plan

Prepared for
City and County of Denver
Denver, Colorado

April 1987

Prepared by

Woodward-Clyde Consultants 
Strategic Insights
Slosky & Company
Greystone

result in rail cars being stored or handled in ways that could increase risk, and that in any case, such restrictions would cause significant disruption and hardship to rail operations. In spite of those feelings, preliminary examinations of the data indicated that the potential risk reductions could be substantial, so an assessment of the risk reduction potential of this alternative was performed before considering it further.

1.5 Re-Routing of Certain Hazardous Materials. The lack of alternative rail routes and the fact that most Denver hazmat traffic is either destination or origination, leads to the conclusion that this alternative is not feasible. However, increased discussion and evaluation may be appropriate concerning limitations on future transuranic or other "new chemical" hazmat shipments through Denver.

1.6 Community Action Program and Accident Warning System. There is a potential for risk mitigation along these lines, but its effectiveness is unclear. Accident warning systems (in addition to the current sirens) may be appropriate for further study, and railroad-to-community information and emergency response programs should be retained as options as the CPV is developed. However, since these types of measures are not amenable to risk assessment, they will not be evaluated further in this study.

1.7 Design and Condition of Rail Cars Carrying Hazardous Materials. While the city cannot regulate the design or condition of rail cars, it could inspect them. Therefore this alternative will be combined with alternative 1.1 above.

1.8 Railroad Employee Training and Surveillance. The railroads already have such programs. However, this alternative was retained for assessment to see if improved training and surveillance would be an effective alternative in reducing risk.

For the results of these technical model evaluations, see the full report Chapter Five and page 20 of the this Executive Summary.

2.0 Capital Improvements

2.1 Grade Separations. From a preliminary examination of the data, it seemed likely that the risk assessment model would show that this alternative would not effectively mitigate hazmat risk. In fact, it was estimated that the risk assessment model would put a very low upper bound on the risk mitigation possible through any measure to reduce crossings accidents, including alternatives 2.2, 3.1, 3.2 and 3.3 which are listed below. Therefore consideration of any of these alternatives was deferred until their effectiveness could be assessed by the risk assessment model.

2.2 Fire Plugs, Water Lines, Controlled Drainage and Segregated Sewers. CPV development would automatically include significant replacement of fire plugs and water lines to an extent that it would be difficult to assess much risk reduction potential in increasing the extent of that network. Storm sewers with cut-off valves were seen as a potentially good idea for limiting and controlling the spill. Consideration of drainage control was deferred until the risk assessment model could determine its potential for risk mitigation.

2.3 Hazardous Materials Laboratory. This option was judged to be ineffective for the types of rail hazmat accidents that would involve significant public risk, due to the time delays inherent in the use of such a lab.

3.0 Development Measures

3.1 Setbacks. Preliminary data indicated that many of the risk impacts were relatively close-in, suggesting that setback restrictions could be effective. In addition, such restrictions were judged to be feasible. There, consideration of this alternative was deferred pending the results of the risk assessment model.

3.2 Barriers. As with alternative 4.1, preliminary data that barriers could be effective, and they were judged quite feasible by the Advisory Committee. Therefore, consideration of this alternative was deferred pending the results of the risk assessment model.

3.3 Use Restrictions. Concerns were raised about some hazardous facilities in close proximity to the tracks. While the feasibility of moving existing facilities is problematic, it makes sense to restrict the siting of future hazardous facilities. It also makes sense to consider restricting high-population-density facilities near the tracks. Either restriction may be feasible, since most of the impacts of rail accidents are relatively close-in, which means that the restricted area would not be large. In addition, the level of risk for each of several sizes of restricted areas would be one output of the risk assessment model. Therefore, consideration of this option was deferred pending results of the risk assessment model.

4.0 Emergency Preparedness Actions.

4.1 Improve Communications, Equipment and Training. These options could hold some promise. However, by their nature they were not amenable to analysis by the risk assessment model, and they were addressed by other mechanisms, including a table-top simulation of a emergency response and possible future actions by the Denver group working with the community-right-to-know provisions of the Superfund Amendments and Reauthorization Act

Politicians want probe of fires along railway

July 7/88
By Tony Wong Toronto Star

Firefighters are blaming Metro's hot, dry weather for creating a fire hazard along railway lines, after seven fires were started by one train near homes and businesses in Scarborough.

The problem is so acute in the city that some Scarborough politicians are demanding an investigation.

"This is ridiculous. Something has to be done about those fires. They're a threat to life and limb, and we don't want Band-Aid solutions," said Alderman John Wardrope, in whose ward the fires occurred.

"We don't need our firefighters acting as insurance agents for CP

trains," said Alderman Marilyn Mushinski yesterday. "This must be stopped before lives are taken."

Scarborough deputy fire chief Ross Forfar said the seven grass fires occurred Monday afternoon in the Warden Ave.-Ellesmere Rd. area, tying up 37 firefighters and nine fire engines.

He said the problem occurs when engines shoot sparks from their exhausts and start brush fires along railway right of ways.

The two CP Rail locomotives hauling the train that caused the fires have been taken out of service and are being examined for problems, fire officials said.

Jim Macdonald, Scarborough's assistant director of fire prevention, said he is worried about firetrucks being tied up with grass fires when there's the possibility of an emergency occurring.

Macdonald said he travelled the rail route with CP officials yesterday to determine the extent of the problem.

John Cox, CP Rail spokesman said engines were being inspected to make sure exhausts were clean. He said the company was also adding extra engines to trains so they wouldn't be overworked and produce sparks.

2 more fires

Meanwhile, fire officials cited the dry weather as a factor in two more brush fires that broke out along the rail line, again in the Warden Ave. and Ellesmere Rd. area, Tuesday afternoon.

Fire officials contacted in Etobicoke, East York, North York and Toronto say they experience some brush fire problems, especially in this weather, but not as many as Scarborough does.

Ironically, Monday's fires happened the day Scarborough's building, fire and legislation committee demanded a report from the fire department and CP Rail on how further fires could be prevented.

One of the seven fires happened 20 feet from Premdor Incorporated, Canada's largest maker of doors, which keeps a large supply of lumber on hand.

Ibrahim Oner, plant and engineering manager for Premdor, had warned politicians and fire officials earlier that the plant, which employs 500 people, "would burn to the ground one day" because of the extremely dry conditions.

Forfar said the problem was Metro-wide and not exclusive to CP trains, although 43 of 46 grass fires this year had been caused by CP locomotives.

Macdonald said residents living near railway property can alleviate the problem by not storing combustible materials near fences, keeping plants and shrubs watered, and not disposing of grass clippings by throwing them on to railway lands.

*** THE TORONTO STAR, TUESDAY, JULY 5, 1988 / A7

Train sparks could ignite major blaze officials warn

By Tony Wong Toronto Star

The hot, dry weather is creating a major fire hazard for residents and businesses near railway lines throughout Metro, fire officials say.

"It's a real problem when trains shoot out sparks from their exhaust and start brush fires along the railway lines," Scarborough's deputy fire chief Ross Forfar, told the city's building, fire and legislation committee yesterday.

In Scarborough alone there have been 46 brush fires on railway right-of-ways so far this year, Forfar said.

North York and East York have also experienced similar problems, he added.

"It's a deep concern with us that a fire may start and go out of control if it gets into one of the industrial units along the line," he said.

Ibrahim Oner, plant engineering manager for Premdor Inc. at Warden and Ellesmere Aves. told the committee there has been a fire at the 500-employee company's lumber yard in each of the last five years.

"That place is going to burn to the ground some day if something isn't done," warned Oner. "Because of the nature of the product, we're extremely vulnerable."

Burned fingers

Oner said a security guard turned his fingers putting out a fire that started after work one day in June. Several times, production lines had to be stopped as workers put out fires.

Trains going to the Agincourt marshalling yards from the south end of the city along the northeasterly train route cause the greatest problems, said Forfar.

"There's a steady grade there that causes the trains to work extra hard, so they spit out the sparks," he said.

Forfar also said 43 of 46 fires this year had been caused by CP Rail trains.

Scarborough politicians wanted to know why nothing had been done about the problem before.

"It's the time we sent CP Rail a clear message that we're not going to tolerate it any more," said Alderman Marilyn Mushinski.

The committee asked for written reports from the fire department and CP Rail.

CP Rail spokesman John Cox said the problem was seasonal, but the company was adding extra engines to trains so they wouldn't be over-worked and produce sparks.

Forfar said his department was prepared to lay charges under the Fire Marshal's Act if the fires con-

Ways sought to block trespassers from rail stretch where 29 killed

BY GAY ABBATE

Special to The Globe and Mail

The Canadian Transport Commission is trying to find ways of keeping trespassers off a section of railway track where 29 pedestrians have been killed and 12 others injured since 1981.

The section in question is 117.4 kilometres of Canadian National Railways track along the Kingston subdivision main line between Oshawa and Toronto and the Oakville subdivision main line from Toronto to Hamilton. The line passes through Pickering, Scarborough, Toronto, Etobicoke, Mississauga and Burlington.

A recent report prepared for the commission by its railway transport committee found that most of the trespassing takes place in Scarborough, where six high-risk areas were identified. Toronto had one area of frequent trespassing — the five-kilometre stretch between Main and Queen streets. In Etobicoke and Mississauga, the worst section is between Brown's Line and Winston Churchill Boulevard.

The six Scarborough locations are the Rouge Hill area, the bridge over Highland Creek, the area opposite Chemical Court, which is across from a park, Manse Road to Morningside Avenue, Markham Road to Eglinton Avenue and Birchmount Road to Victoria Park Avenue.

Of the 29 deaths, 18 are suspected suicides, and five of the 12 injuries are listed as attempted suicides. Eight of the deaths and three of the injuries took place in Scarborough.

The report says the main reason people trespass is to cross the tracks on their way to or from work or to some recreational attraction. Youngsters often trespass to place debris on the tracks, camp on the right-of-way, play on rail cars or vandalize them.

Most of the trespassers are males between 11 and 25, the report says, but only half of those injured and only 42 per cent of those killed since 1981 have been 25 or younger. Only five of those injured or killed were women.

The report criticizes municipalities for permitting residential development close to railway tracks.

The report singles out the City of Scarborough as an example of poor planning that could have dangerous repercussions. Scarborough City Council allowed a new subdivision to be built immediately abutting the railway tracks about 1.6 kilometres east of the Rouge Hill GO Transit station. Lake Ontario, on the other side of the tracks, will attract trespassers, the report says. The nearest public crossing over the tracks is half a kilometre east.

The report says it will take a lot of money, considerable political will at the municipal and provincial level and determination on the part of railway officials to reduce tres-

passing. It has recommended that meetings be held by all affected parties to deal with the problem.

Suggestions in the report include:

- Education programs aimed at specific age groups and neighborhoods;
- Fencing of all paths parallel to

tracks;

- Concrete or metal fences or walls at frequent trespass locations;
- Enforcement of trespass and vandalism laws. The fine under the Ontario Provincial Trespass and Property Act is \$53.75, while the Railway Act provides for a \$20 fine

SECTION 8

BUFFERS

- Buffer zones be so established as to allow railway - compatible infrastructure and activity, and that such zones be considered for other transportation and utility corridor uses at the same time; and that
- As redevelopment occurs along existing rail corridors, the Municipalities ensure that compatible land uses are put into place.

— Recommendation of The Toronto Area Rail Transportation of Dangerous Goods Task Force, Final Report – 1988

THE TORONTO STAR

Tuesday, May 3, 1988

Published at One Yonge Street, Toronto M5E 1E6 by Toronto Star Newspapers Ltd.
a wholly owned subsidiary of Torstar Corp.
Established 1892 — Joseph E. Atkinson, Publisher, 1899-1948
March paid circulation Monday-Friday 507,994
Saturday 810,519, Sunday 529,280
Member of the Audit Bureau of Circulations
Member of the Ontario Press Council

BELAND H. HONDERICH, Publisher
DAVID JOLLEY, President

RAY TIMSON, Executive Editor
IAN UROUHIART, Managing Editor
JOHN HONDERICH, Editorial Page Editor
GARY LAUTENS, Editor Emeritus

Editorials

Wanted: buffer zone

There has always been great uneasiness about building homes too close to rail lines, especially after the Mississauga train derailment.

That concern has surfaced once again with Ontario Hydro's plan to sell a strip of land close to its North Toronto rail line for housing. The publicly owned utility has proposed selling off a 1.4-hectare (3.4-acre) strip of surplus land next to the CP Rail line in the Mount Pleasant Rd.-Summerhill Ave. area.

Despite its precarious position, it's estimated the land — located between Moore Park and Rosedale — would be worth about \$2.3 million, if the City of Toronto gives the go-ahead to build about five or six luxury homes on the site.

Area residents and the city want the land kept as a natural park. CP, CN and those concerned about rail safety want most of it kept as an undeveloped buffer zone between the tracks and the exclusive homes just to the north.

And Ontario Hydro has refused the city's offer to buy the land for \$1.

However, developing this site now doesn't make sense.

Before any building is allowed right up against railway lines, Metro and the railways should come up with some policy on buffer zones. If there is a risk people could be seriously hurt, then city officials shouldn't allow any construction.

And if that is the case, then Toronto City Council has no choice but to create a legal buffer zone on those lands and prohibit their development.

themselves responsible only for actions within their own rights-of-way, and cannot economically justify expanding these rights-of-way and remain competitive. The railways feel that the Municipalities have not been consistent in dealing with encroachment, and therefore should assume some responsibility for the present situation.

From a Provincial and Federal Government perspective, we learned that:

- The Federal Government regulates the railways within the rail right-of-way whereas the Province of Ontario regulates the use of land outside that right-of-way;
- The Province of Ontario, while issuing guidelines to mitigate noise and vibration, feels that safety is the responsibility of the person or organization creating the unsafe situation; and
- The Federal legislation governing airports, the Aeronautics Act, is used to ensure the safe operation of aircraft, and in effect controls the use of land surrounding airports.

Encroachment has already developed along the existing system for many years. To implement a buffering concept along this network is impossible. We are convinced, however, that buffering is possible in areas not yet filled-in along the existing rail lines, within the Parkway Belt, and along any new line constructed in the future. In existing corridors, as redevelopment occurs on adjacent lands there is an opportunity to ensure more compatible land uses.

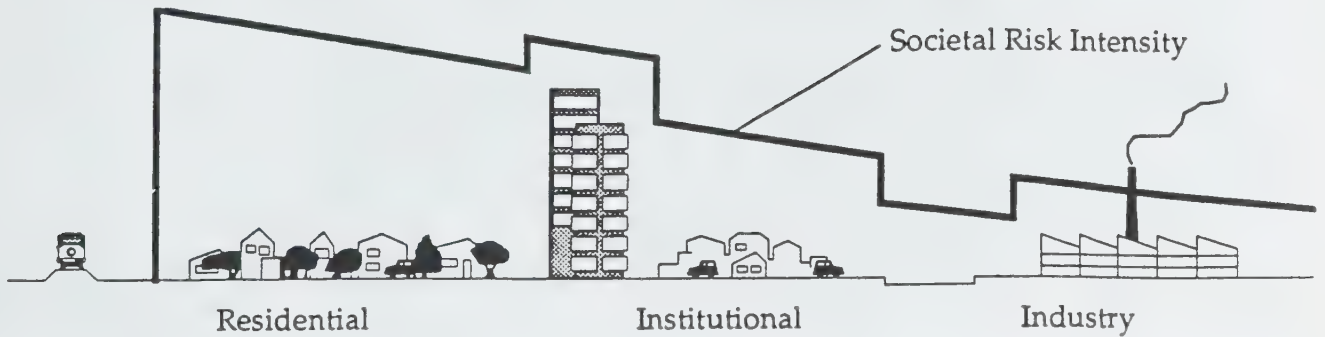
3.12.C Mitigative Measures

We studied various buffering measures, from open space 'setbacks' to physical barriers such as walls, berms and ditches. We also looked at the use of lands between the railways and more sensitive land uses, such as hospitals, schools, senior citizen accommodations, and high density establishments.

Sterile land setbacks, of an appropriate width, would be prohibitively expensive and therefore impractical. Our studies also show that walls, berms and ditches were not effective against clouds of toxic gases, or BLEVEs (Boiling Liquid Evaporating Vapour Explosions).

However, we are convinced that setback lands could be developed for compatible uses, such as industry, agriculture, parks, and the like. Exhibit 3.43 illustrates the difference between sensitive land use development along lines without buffers and more compatible development along the same lines, within a properly-zoned setback area. Exhibit 3.44

Present Zoning (no buffer zone)



Restrained Zoning (with buffering)

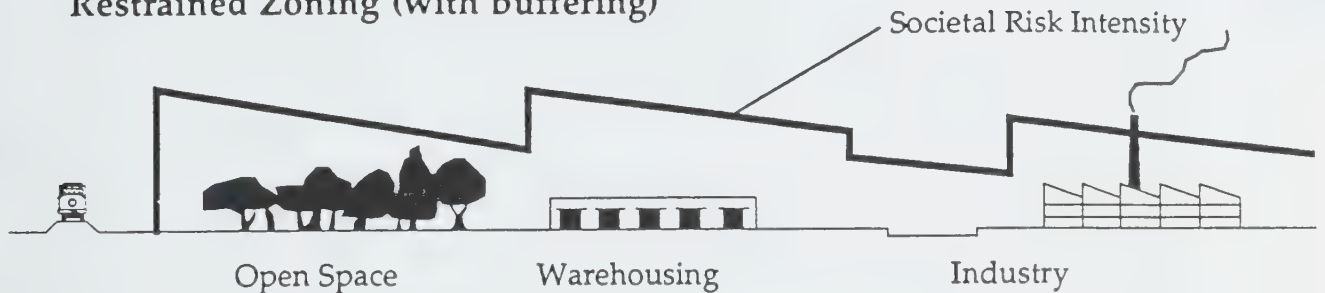


Exhibit 3.43
Conceptual Risk
Reduction through
Restrained Zoning

illustrates what is being proposed for Regina, Saskatchewan where they expect to use this same compatibility concept.

3.12.D Buffer Zone Widths

The width of a buffer determines not only the costs involved, but the degree of risk reduction achieved.

The utility corridor established in Edmonton to accommodate a freeway, pipelines and an electric power transmission infrastructure is 2600 ft. wide. The setback corridor proposed in Regina is 2000 ft. wide (1000 ft. on either side of the track.) Our consultants determined that individual risk declines rapidly as the distance from the track increases and that a distance of 400 metres (1200 ft.) on either side of the track would reduce risk to an individual by one hundred fold. This risk would therefore be in the neighbourhood of one in a million chances of being fatally injured - an informal

THE TORONTO AREA RAIL TRANSPORTATION OF DANGEROUS GOODS TASK FORCE

CONSULTANT'S REPORT

PUBLIC PERCEPTION
SURVEY

ROUTES

RISK ASSESSMENT

RISK MANAGEMENT

SPEED

TECHNOLOGY & SAFETY
ADMINISTRATION

BUFFERS

LAND USE

EMERGENCY RESPONSE

DELCAN

Canada

of separation is set out in a table of separation distances known as the Revised British Quantity - Distance Tables.

The principle of this Act is that the problem must be resolved by those who created it. One must also remember it is far easier to move an explosive magazine than an airport runway, hence the fundamental difference between the Aeronautics Act and the Explosives Act.

Municipal Policies and Buffering

Introduction

Investigations have led to the finding that some Municipalities have followed a land use control approach through their legal plans and zoning regulations. This has not necessarily been under the urging of a Provincial Government through a policy such as a "Provincial Policy Statement" as provided for in Ontario.

In fact, two of the most notable land use buffers were in the City of Regina Development Plan 1979, and the Restricted Development Areas implemented by the Alberta Government.

Regina Development Plan

The Regina Development Plan has undergone major updating as a result of the railway relocation project which has been an issue since the mid 1970's. The railway initially ran through the centre of Regina and the plan is to relocate the railway corridor north of Regina through the Municipality of Sherwood.

Initially an "Environmental Impact Study" was undertaken for the "Rail Relocation Office". This study recommended a 1000 ft. setback on either side of the railway, creating in effect a 2000 ft. right-of-way for the track. The "Emergency Measures Organization" concurred with the scale of the corridor specifically because of the danger of hazardous spills.

Taking this 2000 ft. wide corridor one step further, the City decided that land uses should be permitted **within** the corridor but that the overall land use strategy should be one of compatibility both with railway operations and City growth plans. The first major decision was that **no residential development** would be permitted in the corridor. The concept is illustrated in Figure 3.1.

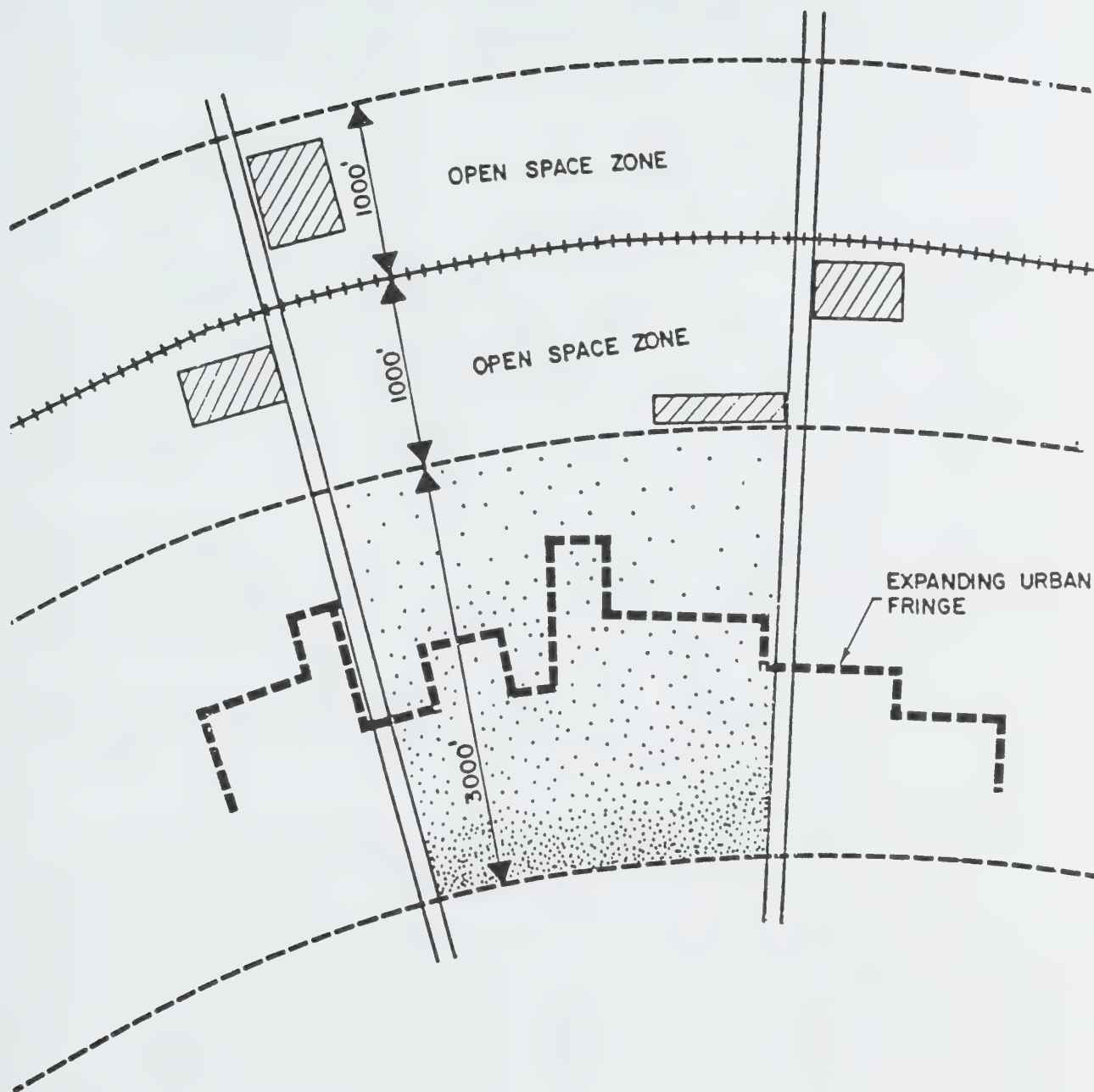
A concept plan was prepared to allow institutional, recreational, commercial, industrial and agricultural uses within the corridor but excluded residential development. Commercial development would be allowed at strategic locations where major arterial roadways cross the corridor. The other land uses would relate to the growth trends of the City of Regina so that final land use would conform with an overall land use pattern.

Although residential development would not be permitted within the corridor, the study recommends that residential densities decrease as one approaches the railway corridor. For example, five to ten dwelling units per acre (single family and low density row housing) would be permitted between 1000 to 3000 feet from the railway line itself. At this point, medium densities would be permitted up to twenty dwelling units per acre (high density row housing) for the next one or two thousand feet. Only then would land use designations permit high density apartment uses.

A "Development Plan" in Saskatchewan resembles the "Official Plan" in Ontario. There is no reason why an Official Plan could not designate such land use patterns for a newly developing area adjacent to a railway line. In this regard the Regina approach could be used in Ontario.

Restricted Development Area, City of Edmonton

The "Restricted Development Area" is a half-mile wide corridor of land around the City of Edmonton. It is intended as a multi-use corridor to accommodate a major freeway, pipeline and electrical utilities.



LEGEND





-  LAND USE COMPATIBLE WITH RAIL CORRIDOR
-  URBAN ARTERIAL ROAD
-  DENSITIES DECREASE CLOSER TO RAILWAY CORRIDOR
-  RAIL CORRIDOR

Figure 3-1
THE REGINA EXAMPLE

Actually, this is not a municipal project per se in that it has been implemented under the Alberta Environment Act by Alberta Environment. Any land use proposals put forth by private landowners must be approved by the Minister of the Environment and the Minister can veto any proposal or any recommendation by another level of government.

As in Ontario, the Regional Development Plan imposes the same controls at the regional/municipal level.

Thus far, the legislation has stood up in court, perhaps primarily because the provincial government has adopted a policy of land acquisition and has at present accumulated approximately 60% of the land within the Restricted Development Area. This follows the principle of compensating for loss of proprietary rights found in other Legislative Acts and implies as a final objective that the Province will **own the land**.

Two specific conclusions have been drawn from the Restricted Development Area approach in Edmonton. First, it has been continually stated that a special agency should be responsible for the Restricted Development Area program rather than a department of the government. Secondly, given the final objective of owning the land it would have been preferable to move very quickly in this acquisition program to prevent the political backlash that has occurred.

On the technical side, the half-mile wide corridor of land intended for a freeway system, pipelines and power lines, etc., was established based on the best knowledge of technical experts available to Alberta Environment. The exact justification for the corridor width has not been researched in detail, but it seems one might say that, as in Regina, a corridor was selected which was thought to be practical for most circumstances. Regina's corridor is 2000 ft. wide and Edmonton's corridor is about 2600 ft. wide. Edmonton's is intended for infrastructure while Regina's is intended for complementary land uses.

From the point of view of a risk analysis, it may be shown that a different width for a corridor would produce approximately the same level of safety and

such an assessment may ultimately assist in determining the most reasonable corridor width for safely transporting hazardous goods by rail. The above examples illustrate what other jurisdictions have found to be reasonable.

Railroad Policies and Buffering

Canadian National Railways and Canadian Pacific Railways prepared a joint policy paper in February, 1983. The paper dealt specifically with noise problems and vibration and recommended berms ranging in height from 2 m to 2.5 m and called for building setbacks of 15 m to 30 m depending on the nature of the railway line. It must be stressed that this was to resolve environmental issues relating to railway noise and vibration impact. It did not deal with safety.

Of interest was the railway's conclusion that residential buildings within 75 metres from the railway right-of-way (not the track) should be supported on rubber pads inserted between the foundation and the occupied structure.

Quasi-Judicial Decisions Regarding Buffering

Canadian National Railways has recorded several decisions by the Ontario Municipal Board supporting the railway's requests for buffer zones. The buffer zones take the form of setbacks, berms and walls.

The Board's decisions have ranged from not allowing the redesignation of industrial lands to "residential", to imposing a 30 metre setback from railway rights-of-way for residential development. There has been a great deal of controversy regarding buffer zones, as reported by the media.

Recently in the Town of Richmond Hill, the Ontario Municipal Board did not support CN's request for a 3 metre fence on top of a berm. Also, residents have complained to the Town of Richmond Hill because houses were built 23 metres from the railway although the O.M.B. approved a minimum 30 metre

setback from the tracks. There is disagreement over the viability of ameliorative safety measures, e.g. high barrier walls could result in children climbing them and falling off. In other instances the O.M.B. has required the landowner/developer to provide six foot high chain link fences along property lines.

Generally, it is important that the Board has supported 30 metre setback provisions and has directed that they be required in Zoning Bylaws and Site Plan Agreements.

Summary of Legislation

Two aspects are important when considering the relationship between current legislation and railway buffering. In the first instance, there does not appear to be legislation enacted by any level of government which deals directly with railway buffering. The second aspect to be considered is more important, the point being that all levels of government have enacted legislation which either directly or indirectly could be adapted to deal with railway buffering.

Federal Legislation offers some interesting opportunities for land use zoning, limitation of proprietary rights (with or without compensation), and land acquisition with either freehold tenure or some other alternative such as an easement or lease.

Provincial legislation seems to offer more opportunity for developing a comprehensive approach to railway buffering, and the Planning Act would appear to be the best vehicle. It offers the advantage of accommodating general guidelines and policies emanating from the ministerial level down to site specific control mechanisms such as Zoning By-laws and Site Plan Control Agreements that could require berming, fencing and landscaping. It was this type of control system which led to successful implementation of corridor buffering in Edmonton and Regina.

Most Provincial Legislation encountered deals in one way or another with acquisition of land when necessary to implement the objectives of the legislation.

Municipal legislation seems to emanate from Provincial legislation. Some municipalities have been very successful in establishing railway buffers and in some instances, such as the Regina situation, the municipality has been successful in allowing secondary land uses within the buffers which are compatible with the overall growth trends of the city.

Because railway buffering is an issue which overlaps government jurisdictions, dealing with the issue in a **consistent** way will be important; this suggests that a number of levels of government be involved. The successes of legislation when approached in this manner, e.g., the Aeronautics Acts, are apparent.



HON. IAN SCOTT M.P.P. ST. GEORGE-ST. DAVID QUEEN'S PARK REPORT

SPRING 1988

RAIL SAFETY-ONTARIO TAKES A STAND

I know that many of you are concerned about the safety of dangerous goods transported through Toronto by rail. I share your concern and was pleased to participate in the preparation of the submission made by the Province of Ontario to the Gilbert Task Force on Rail Safety. As well, I appeared before the Task Force as your M.P.P. to highlight for them your concerns about personal safety.

For me and for the Province of Ontario our primary concern has to be for the safety of the people who live near railway tracks. Over 60,000 carloads of dangerous substances such as ammonia and chlorine pass through Toronto each year. The consequences of any rail accident would be disastrous. I believe that every effort must be undertaken to protect human lives from such an accident.

The Province realizes that in the short term dangerous goods will continue to be transported by rail through Metro Toronto. Any long term solution will realistically take years to implement. In the interim the Province of Ontario has recommended that the following changes be put into effect as soon as possible:

- the installation of advanced automatic train controls combined with manual inspection of trains at strategic gateway locations;
- welded track with concrete ties;
- elimination of existing main line grade crossings;
- controlled configuration or mixing of dangerous cargoes combined with enroute monitoring.

On a long term basis the Province of Ontario through the Ministries of the Environment and of Municipal Affairs are currently developing a provincial policy statement on environmental land use compatibility. One of the main elements that will be discussed in this statement is the concept of buffers as a means of separating incompatible land uses so as to minimize the adverse effects they may have on one another.

In conclusion the Province of Ontario has strongly endorsed the Task Force's mandate to examine:

- ways and means of improving safety for people living near existing rail corridors carrying dangerous goods;
- the feasibility of rerouting or relocating the rail flow of dangerous goods traffic away from densely populated areas;
- additional operating strategies, such as speed adjustments to improve safety of existing operations.

I look forward to the final report and recommendations of the Task Force. The Province of Ontario will be studying the report closely to determine what steps it can take within its own jurisdiction to protect public safety for people living near railway lines.

SECTION 9

RAILWAYS WANT SETBACKS

... "it is inappropriate and difficult to attempt to identify every possible situation ahead of time" as would be accomplished by legislating a setback

— J. Bret Biggs
General Manager, Land Development
Marathon Realty Company Limited –
January 11, 1988



Great Lakes Region

CP Rail

Intermodal Freight Systems

TORONTO, April 18, 1988

DELIVERED

Alderman Nadine Nowlan
Chairman and Members of
Land Use Committee
City of Toronto

(c991uc88254:292)

Dear Madam and
Members of the Committee:

Re: City of Toronto Interim Policy-Residential
Development Adjacent to Rail Corridors

CN Rail and CP Rail are making this joint submission to provide preliminary comments on the report of 24 February 1988 from City Planning Staff and its recommendation.

The recommendation in the report is:

"That City Council adopt an interim policy that new residential development requiring Committee of Adjustment approval or rezoning, adjacent to the portions of North Toronto, Galt and Mactier/Weston Subdivision railway corridor shown on Map 1 be required to be setback a minimum of 30 metres (100 ft.) from the right-of-way."

CN and CP would like to applaud City Staff for this positive first step towards recognizing and minimizing land use conflicts between rail corridors and adjacent land uses.

We believe, however, that the interim policy proposed by staff could be improved in two areas.

A. SETBACK FOR FREIGHT RAIL CORRIDORS

There is no basis upon which to distinguish between passenger and freight rail corridors for determining the necessary setback from the right-of-way for residential development. Setback distances for principal and secondary mainlines in the railway's standard impact mitigation measures were established on the basis of the longest freight car in service jack-knifing at right angles to the property limit. The length of passenger cars is as long, or longer in some cases, than freight cars and passenger cars travel at higher speed. In addition some of the rail corridors identified as carrying primarily passenger traffic still handle substantial volumes of freight traffic. In any event it is essential CN and CP maintain the flexibility to use their corridors for either passenger or freight train traffic.

Accordingly, we would request that the Committee apply a minimum setback of 30 metres for new residential development from all rail right-of-ways in the City of Toronto regardless of the nature of the traffic presently carried on that corridor.

B. APPLICATION OF SETBACK TO NEW RESIDENTIAL DEVELOPMENT

CN and CP have, since 1983, consistently requested a 30 metre setback for all new residential development, whether or not the land is already zoned residential.

We would, therefore, urge that the City's interim policy regarding setbacks from rail right-of-way apply to all applications of policy amendments, zoning by-law alterations, severances, subdivision or condominium plans that result in or permit the creation of a new residential unit or lot, or the conversion of residential units to freehold, co-operative or condominium ownership.

- * For the Committee's information we are enclosing a brief of OMB decisions involving official plan amendments, plan of condominium and subdivision, severance and rezoning where the Railway's requirements were recognized and ordered by the Ontario Municipal Board.

/...3

* On file in the City Clerk's Dept.

CN and CP look forward to working with City Staff to developing a policy appropriate to the City of Toronto with respect to new residential development next to rail right-of-ways.

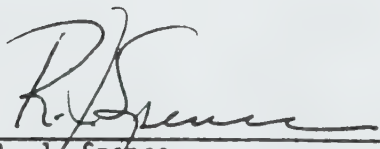
We have also received the supplementary report of planning staff dated April 7, 1988. The report suggests that without study by the City with respect to CN-CP's policies, the findings of various consultants with respect to transportation of dangerous goods and a risk-cost benefit analysis, zoning by-law amendments to implement a 30 metre setback provision would be arbitrary and difficult to support.

The railways' setback standard, of 30 metres for the classification of rail corridor in question was established in 1983 after in excess of 5 years of discussion and review. The question of the appropriateness of the standard has been extensively litigated before the Ontario Municipal Board as the enclosed brief of OMB decisions indicates and the issue of a risk-cost benefit analysis has also been explored in the context of this litigation. In every case of which CN and CP are aware, the OMB has upheld the railways' setback requirements for new residential development in the face of sometimes strenuous opposition by landowners and municipalities.

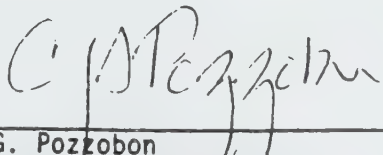
A 30 metre setback does not relate in any way, to the question of the transportation of dangerous goods by rail. The imposition of a 30 metre setback is an attempt to minimize the consequences of a derailment regardless of what is being carried on that train. Any possible future federal government decision concerning dangerous goods rail traffic in the Metro Toronto region has nothing to do with the need for this setback.

Contrary to what City Planning Staff would suggest, it would in the railways' opinion be arbitrary if the City were not to implement a 30 metre setback provision as recommended in this submission in light of the long history of its implementation and the extensive litigation that there has been concerning this issue throughout the Province of Ontario.

Yours truly,



R. J. Spence
Environmental Protection Officer
CN Rail



G. Pozzobon
Manager of Development
CP Rail

Encl.

cc: VIA Rail

cc: Mr. T.G. Smith, P. Eng.
Managing Director
GO Transit
555 Wilson Avenue,
Downsview, Ontario
M3H 5Y6

Mr. W. Van Hinte
Regional Manager
Planning and Administration
CN Rail
277 Front Street West
Suite 805
Toronto, Ontario
M5V 2X7

Mr. R.V. Doty
Consultant.



July 11, 1988

Alderman Nadine Nowlan
Chairman,
Land Use Committee
City of Toronto
City Hall
Toronto, Ontario
M5H 2N2

Dear Madam Chairman:

Re: Proposed Interim Policy on Restricting Development
Adjacent to the Rail Corridors

Marathon Realty Company Limited is pleased to have had the opportunity to review the various Planning and Development Department Reports and associated correspondence related to the above noted topic.

We appreciate the City's efforts in working towards the elimination of any potential conflicts between rail corridors and adjacent land uses. It should however, be recognized that mitigative measures may provide an alternative to legislating setbacks from rail corridors.

Potential land use conflicts have been addressed in major North American cities through specific engineering considerations. These can include berms, barriers and containment facilities. The mitigative measure(s) would be tailored to address specific contributing site conditions such as land use, topography, and other environmental factors.

May I draw your attention to correspondence submitted to Land Use Committee dated May 17, 1988 from CN Rail/CP Rail. In addition to designing protective measures based on topographic and other considerations, the railways are in agreement that development adjacent to rail corridors can be done on a site by site basis and that " it is inappropriate and difficult to attempt to identify every possible situation ahead of time " as would be accomplished by legislating a setback.

Marathon Realty is in the process of preparing development plans for our holdings adjacent to the North Toronto Subdivision, commonly referred to as Yonge-Summerhill. The development plans will take into account the requirement to alleviate potential land use conflicts. The mitigative measures which will result from these plans will be refined further during the design of the project under continual consultation with the municipality, the operating railway and recognized consultants.

The reliance on only a stated inflexible setback in urban areas, we would submit, is inappropriate. No setback in urban areas will effectively satisfy a rail incident concerning dangerous goods. It is our understanding that the 30 metre setback is in response to the spatial nature of the derailed vehicles.

Public protection from a dangerous goods spill is another matter entirely. We would suggest that there may be other measures that may effectively be employed in lieu of setbacks.

We would request that Land Use Committee afford the developer an opportunity to resolve any potential land use conflicts to the satisfaction of both the operating railway and the municipality on a site by site basis.

Yours truly,

MARATHON REALTY COMPANY LIMITED



J. Bret Biggs, M.Pl., MCIP
General Manager
Land Development
Ontario

JBB:mc

SECTION 10

TORONTO SAFETY POLICY PENDING

It is therefore recommended that the City Commissioner of Planning and Development be requested to proceed with the development of an appropriate interim or short-term land use policy for regulating new development adjacent to railway corridors. The definition of a suitable long-term land use policy should await the final outcome of the Federal Task Force's studies.

- Philip E. Wade Associates
A Strategic Overview, Hazardous Goods
Transportation by Rail in Toronto
- Adopted by City of Toronto Council,
January 1987

Land Use Committee

February 24, 1988

APPENDIX 1

CITY OF TORONTO
PLANNING AND DEVELOPMENT DEPARTMENT

333/088030
Policy
February 24, 1988
Ed Mihalcin
392-7977

To: Land Use Committee

Subject: Residential development adjacent to rail corridors.

Origin: City Council, January 11 and 15, 1988. (c711uc88100:129)

Comments:

1. BACKGROUND

City Council, at its meeting held on January 11 and 15, 1988, adopted the following resolution:

"WHEREAS the 1983 Railway Transport Committee Burton Post Report identified that the potential for a catastrophe exists in the City of Toronto concerning the transportation of dangerous goods by rail; and

WHEREAS the November 1986 City of Toronto study, known as the Wade Report, places the C.P. North Toronto Subdivision into the special hazard zone; and

WHEREAS the Federal Task Force dealing with rail relocation and rerouting in the greater Metropolitan Toronto area heard representation by Mayor Arthur Eggleton on January 12, 1988, concerning this most serious issue; and

WHEREAS the Planning and Development Department is currently developing environmental policies for inclusion in the City's Official Plan; and

WHEREAS the question of land use compatibility specifically regarding safety, noise and vibrations with respect to rail operations needs to be addressed.

THEREFORE BE IT RESOLVED:

1. That the Planning and Development Department of the City of Toronto prepare a status report on environmental policy specifically dealing with railway impacts, particular attention to be paid to safety, noise and vibration impacts."

2. INTRODUCTION

In response to this request, my Department is currently investigating suitable land use regulatory measures for new residential development adjacent to rail corridors, with particular emphasis on the main freight corridor which passes through the north end of the City. This report discusses the two interrelated sources of this undertaking and concludes with a recommendation that City Council adopt a policy that new residential development requiring Committee of Adjustment approval or rezoning, adjacent to the North Toronto, Galt and Mactier/Weston subdivision railway corridors be required to be setback a minimum of 30 metres (100 feet) from the right-of-way. This policy would serve as an interim measure until my Department completes its comprehensive study of appropriate amendments to the Official Plan and Zoning By-law for surrounding land uses.

3. CN/CP POLICY ON NEW RESIDENTIAL DEVELOPMENT ADJACENT TO RAILWAYS

(a) The Policy

In 1983 the railways introduced nation-wide safety, noise and vibration policies for residential development adjacent to railway corridors.

The two policies most relevant to safety are required setbacks for new residential development of 15-30 metres (50-100 feet) from the right-of-way combined with berms ranging in height from 2.0-2.5 metres (6.5-8 feet). The setback is based on the possible displacement of the longest rail car currently in use. Berm heights are designed to mitigate any such displacement.

Maximum requirements are used for principal and secondary main lines. Minimum standards apply in the case of principal, secondary and tertiary branch lines. This classification system takes into account track usage, speed of trains, and types of traffic. Measurements of how to calculate the setback and the height of the berm vary with whether the track is elevated, at grade, or in cut.

In addition, the railway's policies are also aimed at minimizing the intrusion of noise and vibration into new

development adjacent to rail operations. Noise guidelines are based on current maximum Ministry of Environment standards. Vibration guidelines are adopted from a 1981 report for the Ministry of Housing entitled "Standards of Acceptable Railway Noise and Vibration Applicable to New Residential Developments Adjacent to Railways".

(b) Implementation

The railways have been imposing their safety, noise and vibration policies for several years and have had considerable success in defending them at several Ontario Municipal Board hearings. A cursory review of some of these decisions involving such municipalities as Scarborough, Richmond Hill, and Mississauga reveals that, to date, the requirements of the railways have taken precedence over development rights or planning arguments such as reconciling land use conflicts.

Two examples in the City of Toronto illustrate the relatively new hard line approach of the railways with respect to new residential development adjacent to existing corridors. The first example is the 1986 objection of CN to the 101 Hanson Street development of Cityhome in Ward 9. An OMB case was avoided only because CN had not previously followed through on their objections to similar developments in the past. A compromise solution on CN safety, noise and vibration policies was therefore possible with CN noting that similar compromises in the future were unlikely. The second example is the 1987 CN objection to the South Riverdale Part II Plan (OPA No. 334) on the basis that the plan fails to recognize the land use regulatory measures of the railways for new residential development. This issue has yet to be reconciled.

4. TRANSPORTATION OF DANGEROUS GOODS BY RAIL

In 1985-1986 my Department participated in a consultant study entitled "Hazardous Goods Transportation by Rail in Toronto: A Strategic Overview", by Philip E. Wade Associates. In January, 1987 City Council adopted the recommendations of that study, including the following related to land use:

- "(k) that the City of Toronto (Planning and Development Department) investigate suitable short-term land use regulatory measures for rail corridors; and
- (l) that the City of Toronto (Planning and Development Department), following the resolution of long-term plans for rail DC traffic in the Toronto area, establish suitable land-use regulatory measures for rail corridors."

Land Use Committee

February 24, 1988

The position of the City of Toronto with respect to the hazardous goods issue is that dangerous commodities being transported through the Toronto region via CP's main freight line should be rerouted to a protected rail corridor north of the densely populated Metro area and that, in the interim, there should be a mandatory speed limit imposed on trains carrying such goods.

This position has been expressed on many occasions; most recently to the Toronto Area Rail Transportation of Dangerous Goods Task Force (Federal Task Force) which is currently reviewing the comments received at its recent public hearing along with the findings of its own consultant studies. The Federal Task Force is expected to present its recommendations to the Federal Minister of Transport sometime in the Spring of 1988. The Federal government will then have to decide what action, if any, it will take on the Task Force's recommendations.

5. CONCLUSION

My Department is currently studying:

- (a) existing CN/CP safety, noise and vibration policies for residential development adjacent to all rail corridors;
- (b) the findings of various consultants with respect to the transportation of dangerous goods by rail in the Toronto Region; and
- (c) the implications of the abovementioned information in terms of impact on surrounding land uses in comparison to the risk of railway accidents.

The objective of these studies would be to determine an appropriate long-term land use policy to govern development adjacent to the railway lines. Because the nature of some of the work may be quite technical, particularly in the area of risk analysis, it may be necessary to hire a consultant to complete this portion of the work. I will report on this aspect of the study once more research has been completed.

Until I complete these studies, it is my opinion that City Council should adopt an interim policy regarding setback requirements for new residential development adjacent to the main freight lines since the issue of rail safety has been raised most often with respect to the lands adjacent to this rail corridor. City Council, on several occasions, has argued on the grounds of safety that the railways should relocate their dangerous commodities (DC) freight operations away from the main freight corridor. Having argued that the existing juxtaposition of land use and rail operations poses safety concerns, Council may be viewed as

Land Use Committee

February 24, 1988

irresponsible for permitting new residential development that is not permitted as-of-right without an appropriate setback from the right-of-way of dangerous goods rail traffic.

A 30 metre setback has been recommended as an interim policy to reflect existing railway policy regarding what an appropriate setback should be for new residential development adjacent to rail corridors. I am not currently recommending a setback provision for new residential development adjacent to other rail corridors in the City which are predominantly used for passenger traffic.

While I have recommended that Council adopt a policy on this issue, Council may wish to pursue stronger action. This could include an interim control by-law which would prohibit new residential development within 30 metres (100 feet) of the right-of-way of the main freight lines. If this approach was to be adopted, the City Solicitor could be requested to report on the wording of such a by-law. In any case, my Department would continue to study appropriate amendments to the Official Plan and Zoning By-law for surrounding land uses. Recommendation:

That City Council adopt an interim policy that new residential development requiring rezoning, adjacent to the portions of North Toronto, Galt and Mactier/Weston subdivision railway corridor shown on Map 1, be required to be setback a minimum of 30 metres (100 feet) from the right-of-way, and that Council request the Committee of Adjustment to adopt a similar policy for applications within the same area.

Robert E. Millward
Commissioner

EM/pmw

CITY OF TORONTO
DEPARTMENT OF THE
CITY CLERK

CLAUSE EMBODIED IN REPORT NO. 18 OF THE
LAND USE COMMITTEE WHICH WAS AMENDED AND
ADOPTED BY CITY COUNCIL AT ITS MEETING HELD
ON SEPTEMBER 6, 1988

.....

30

**TERMS OF REFERENCE - CONSULTANT STUDY ON RISK ASSESSMENT
FOR RAIL CORRIDORS IN THE CITY OF TORONTO**

The Executive Committee recommends that the Clause be referred to the Budget Review Group for consideration and subsequent report to the Executive Committee.

The Committee recommends the adoption of the report (July 8, 1988) from the Commissioner of Planning and Development.

The Committee submits the report (July 8, 1988) from the Commissioner of Planning and Development:

Subject: Supplementary Report on Consultant Study on Risk Assessment for Rail Corridors in the City of Toronto - Terms of Reference

Origin: City Council meeting on May 6, 1988 (c71luc88398:61)

Comments: Your Committee has before it my report dated June 28, 1988, on a consultant study on risk assessment for rail corridors in the City of Toronto. In that report, I recommended:

1. That I be requested to invite Concord Scientific Corporation to submit a proposal to carry out a study on risk assessment for rail corridors in the City of Toronto, in accordance with the attached terms of reference at an estimated cost not to exceed \$90,000. Funds for this expenditure are not available in the 1988 Operating Budget of the Planning and Development Department.
2. That I be requested to report to your Committee recommending that a consultant be hired and that funding be provided.

I am now in receipt of the abovementioned requested proposal of Concord Scientific Corporation. I have reviewed this proposal and I am satisfied that Concord Scientific Corporation is capable of completing the requested study in accordance with the Terms of Reference attached to my June 28, 1988 report at a cost not to exceed \$90,000.

In the proposal, Concord Scientific Corporation has elaborated on my Terms of Reference to better achieve the study objectives. However, this revision does not entail a change in my Terms of Reference.

In light of the above, I have the following additional recommendations.

Recommendations:

1. That funds in the amount of \$90,000 be provided and transferred to the Planning and Development Department's 1988 operating budget in account number 771-330-8-600.

2. That the firm of Concord Scientific Corporation be retained to carry out the study in accordance with the Terms of Reference attached to my June 28, 1988 report on this matter at a cost not to exceed \$90,000.
3. That the City Solicitor be instructed to prepare a contract between the City and Concord Scientific Corporation in accordance with the Terms of Reference attached to my June 28, 1988 report.

The Committee also submits the report (June 28, 1988) from the Commissioner of Planning and Development:

Subject: Consultant Study on Risk Assessment for Rail Corridors in the City of Toronto - Terms of Reference

Origin: City Council meeting on May 6, 1988 (c71luc88372:61)

Comments:

1. Background

At its meeting on May 6, 1988, City Council requested:

1. That the Planning and Development Department Draft Terms of Reference for a Risk/Management Study for rail corridors in the City of Toronto; and
2. That the Toronto Area Rail Transportation of Dangerous Goods Task Force be requested to share the relevant technical information with the City of Toronto.

The purpose of the requested study is to clearly quantify risks to the public living and working near rail lines in the City so that my Department can prepare suitable land use regulatory measures for lands adjacent to rail corridors. Council's decision to commission this study came in the wake of knowledge derived from a previous study entitled "Hazardous Goods Transportation by Rail in Toronto" by Philip E. Wade Associates which states that half of the Toronto public is at risk from rail operations.

2. Terms of Reference

Terms of Reference for a Risk/Management Study for rail corridors in the City of Toronto are attached. After consultation with experts in the field, a firm budget cost of \$90,000 has been assigned to this study. I am recommending that the Canadian firm of Concord Scientific Corporation be requested to submit a proposal in accordance with the attached Terms of Reference. Reasons for this decision include:

1. Concord Scientific Corporation is the firm responsible for risk assessment studies commissioned as part of a series of consultant studies by the Toronto Area Rail Transportation of Dangerous Goods Task Force. As a result, the firm already has the sophisticated data base necessary for a study of this magnitude. This dramatically reduces the costs associated with such a study as well as ensuring high quality results. This firm was chosen after an extensive review of the other firms in this highly specialized field.
2. After reviewing a number of proposals, City Council has recently approved a study regarding risks associated with the location of propane facilities to be conducted by Dr. Doug Napier in association with Concord Scientific Corporation. Dr. Napier is now principal of Concord Scientific.
3. Since there is urgency in this matter, the time required to complete the study is an important consideration. Because of Concord Scientific's previous work for the Federal Task Force on risk assessment of dangerous goods transported by rail and because of their acknowledged pre-eminence in the field, the time required for this firm to carry out the work specified in the terms of reference would be considerably shortened over other alternatives.

I have discussed this study with the principals of Concord Scientific Corporation and they have agreed to immediately submit a proposal for this study based on the attached Terms of Reference. I

will report back later to your Committee on the work program that will result once the study commences and on the composition of an appropriate Advisory Committee to include staff of the Public Health Department, the Fire Department, the Buildings and Inspections Department and the Public Works Department. It is estimated that the complete study will take 8 months from the time of commencement.

Recommendations:

1. That I be requested to invite Concord Scientific Corporation to submit a proposal to carry out a study on risk assessment for rail corridors in the City of Toronto, in accordance with the attached terms of reference at an estimated cost not to exceed \$90,000. Funds for this expenditure are not available in the 1988 Operating Budget of the Planning and Development Department and will have to be provided if the study is to proceed.
2. That I be requested to report to your committee recommending that a consultant be hired and that funding be provided.

Terms of Reference for Risk Assessment/Management Study
for Rail Corridors in the City of Toronto
June 1988

Background

On May 6, 1988, City Council passed the following motion requesting the Planning and Development Department to proceed with a risk assessment/management study for rail corridors in the City:

1. That the Planning and Development Department draft Terms of Reference for a Risk Assessment/Management Study for rail corridors in the City of Toronto; and
2. That the Toronto Area Rail Transportation of Dangerous Goods Task Force be requested to share the relevant technical information with the City of Toronto.

Objective

The present risk assessment/management study for rail corridors in the City of Toronto is required to assist the Planning and Development Department establish suitable regulatory measures for rail corridors which incorporate public safety/risk considerations.

The intent here is to extend the large area risk assessment and management study undertaken for the Toronto Area Rail Transportation of Dangerous Goods Task Force, focusing on the specific hazards to the public posed by dangerous goods (DG) and non-DG rail traffic within the City of Toronto.

The primary focus of the study is dangerous goods rail traffic along the main freight corridor in the City of Toronto. Of secondary interest, are individual and societal risk assessments for populations within 30 m of the main passenger corridor. (see map 1 for depiction of separate study corridors).

The following comprise the terms of reference for the study. Each requirement is followed by a (P) for primary and/or (S) for secondary to denote how it fits into the context mentioned above.

In addition, an asterisk denotes that the relevant information will be the responsibility of the City of Toronto. All other tasks will be the responsibility of the consultant.

1. Data collection, System Review and Information Assemblage

- a) Identify selected locations of hazardous fixed facilities (i.e. industrial plants) where knock-on effects could occur. Identify quantities and types of dangerous goods handled at these facilities. (P)*
- b) Obtain accurate data on current and projected residential and employment population in study area; identify key concern areas such as schools, hospitals, senior citizen residences, etc. (P)*

- c) Obtain data on residential and employment populations within 30 m. of the main passenger corridor (S).*
 - d) Examine physical characteristics of the study rail corridors (P and S).
 - e) Obtain data on common risks experienced by people in the Toronto area (for comparative purposes with risk estimates of this study). (P and S)
 - f) Review pertinent federal, provincial & municipal studies (P and S).
 - g) Determine what other cities are doing on this subject (P and S).
2. Risk Scoping
- a) Identify key situations within the City of Toronto where public safety is threatened by possible rail transportation accidents and existing land uses adjacent to rail routes (P).
 - b) Employ a suitable risk scoping method to screen and set priorities for hazards to the public (P).
 - c) Prepare an interim report on hazards for which priorities have been set with recommendations on which hazards should be subject to detailed risk assessment (P).
 - d) Review prioritized hazards with City officials and advisors to establish a major hazards list for detailed risk assessment (P)(see section 5).
3. Risk Assessment
- A) Hazard and Consequence Analysis
- a) Estimate through the use of recognized methods the potential hazard zones for each of the major hazards selected for detailed assessment (P).
 - b) Estimate the consequences in terms of potential human casualties from the immediate (acute) effects of an accident in each major hazard area. Do not analyse for sub-lethal consequences, but document in qualitative terms the potential implications (P).
- B) Frequency Analysis
- a) Review causes and frequencies of past railroad accidents (P and S).
 - b) Estimate the frequency of rail hazard accidents and non-dangerous goods accidents (P and S).
- C) Quantification of Risk
- a) Estimate levels of risk to the public from both DG and non-DG rail transportation accidents associated with the major hazards (P and S).
 - b) Provide public risk estimates in terms of individual risk, societal risk and societal risk rates along rail routes (P and S).
 - c) Evaluate the relative levels of risk and compare them to commonly experienced risk, particularly in the Toronto area (P and S).
 - d) Delineate risk zones along rail routes as a function of distance away from the railway to aid in evaluation of suitable set-back distances for land use regulatory measures (P).
4. Risk Management Analysis
- a) Estimate costs of land for alternate set-back distances and examine the relationship between risk reduction and cost for these set-backs (P).
 - b) Provide a qualitative indication of other forms of risk mitigation potential (P).
 - c) Make recommendations for risk reduction, particularly with respect to set-back distances, giving consideration to practices in other cities (P).

5. Reporting and Process

The study will be co-ordinated by John Gladki and supervised by an advisory group made up of staff from the City of Toronto. Three full-day meetings will be held with the consultant during the course of the study.

An interim report dealing with the risk scoping analysis will be submitted to the advisory group for review within two months of commencement. The consultant shall also submit a draft of the final report to be reviewed by the Advisory Group within eight months of commencement.

An executive summary shall be included as part of the draft and final reports and in a form for separate reproduction for public distribution. Twenty copies of the final report shall be submitted to the study co-ordinator.

The City of Toronto will be solely responsible for evaluation of the proposals and is under no obligation to proceed further with any proposal reviewed. Rights to the use of all information and materials collected and submitted will rest solely with the City of Toronto.

Consultant Submission

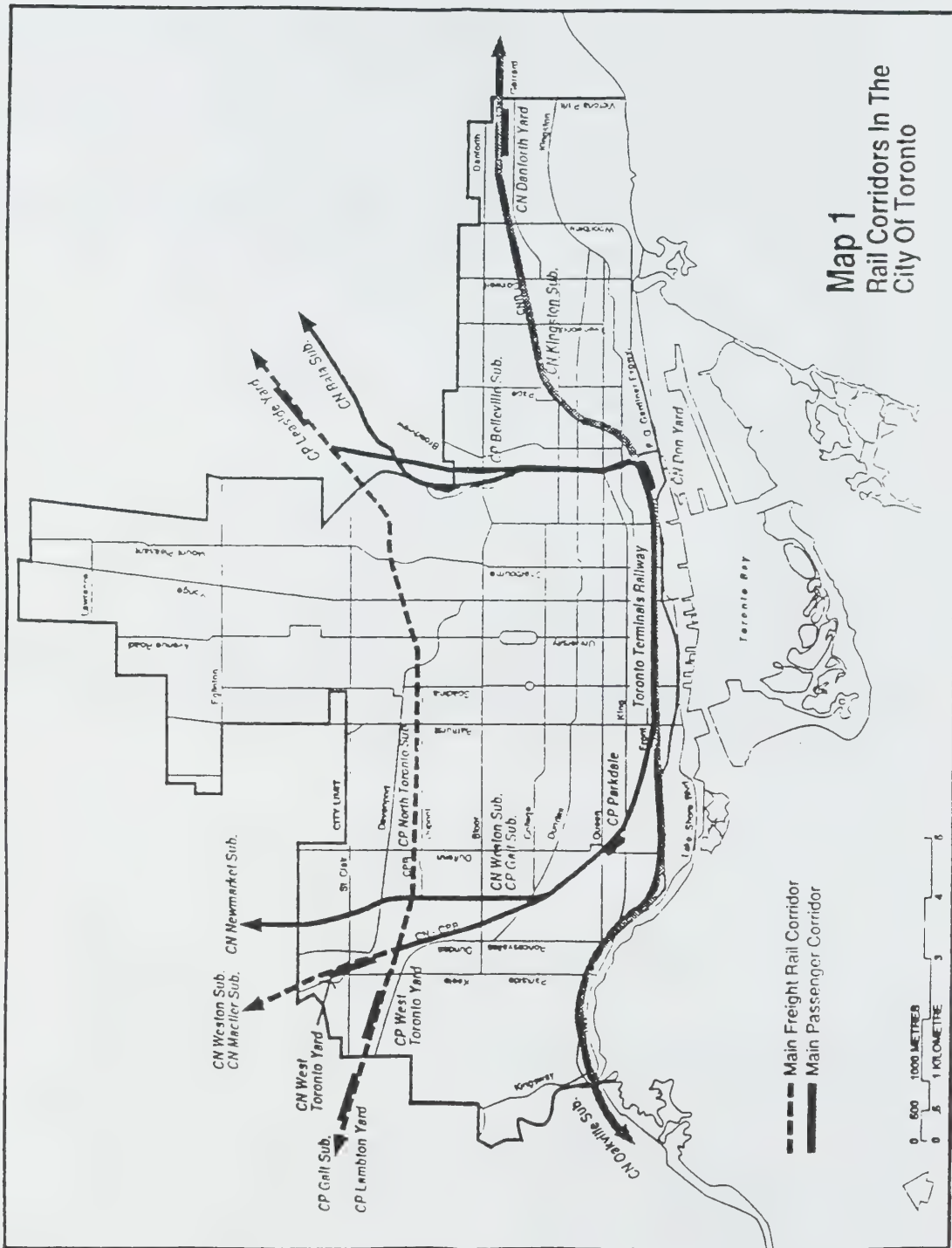
A proposal document should be submitted to:

Mr. John Gladki
Program Manager, Policy Section
Planning and Development Department
20th Floor, East Tower
City Hall
Toronto, Ontario
M5H 2N2

No later than July 29, 1988.

The proposal should include a description of the study approach, the curriculum vitae of personnel who would be working on the study (including that of any outside consultants who may be used for particular work), a description of related experience of the firm in undertaking similar projects, the anticipated work programme and schedule, and cost. Details of the format of the final report and suitability for reproduction must be included in the proposal.

The total cost of the study will be \$90,000.



The Committee also submits the communication (July 12, 1988) from B. W. Hogan, Regional Manager Operations, Canadian National, Suite 805, 277 Front Street West, Toronto, M5V 2X7:

Re: CN/CP-City of Toronto Proposed Study on Risk Assessment for Rail Corridors

We have just been informed of the report of the Planning and Development Department dated June 28, 1988 recommending an expenditure of \$90,000 to carry out a study on risk assessment for rail corridors in the City of Toronto which would appear to duplicate the studies undertaken by the Toronto Rail Transportation of Dangerous Goods Task Force whose final report to the Minister of Transport has not yet been made public.

It does not seem appropriate to spend municipal tax dollars on this undertaking at this time when many hundreds of thousand dollars were expended by the Government of Canada to examine the subject in depth. It would appear advisable to await the complete report of the Task Force with its supporting documents. If the Report is lacking some element then the City may wish to supplement it by a further study.

In any event, it is the opinion of CN that a substantial amount of dangerous goods cargo moves throughout the City by truck over public streets. If the City is truly concerned as to the handling of dangerous goods then any Risk Management Study undertaken by the City should be expanded to include the movement of dangerous goods by motor vehicles over public streets.

(Council Meeting - September 6, 1988)

Council amended this Clause by adding at the end thereof the following:

"It is also recommended that the following motion of Alderman Walker be adopted:

'Whereas the City's Land Use Committee has recommended the adoption of the recommendation of the Commissioner of Planning and Development to undertake a Risk Assessment/Management Study to be carried out by Concord Scientific Corporation; and

Whereas this study calls for the formation of a Technical Advisory Committee to assist the consultant in his undertaking; and

Whereas M-TRAC has specialized and detailed knowledge of the transportation of dangerous goods by rail in general, and more specifically in Toronto; and

Whereas M-TRAC has assisted the City of Toronto in past endeavours concerning rail safety;

Therefore be it resolved that M-TRAC be requested to assist the City of Toronto and participate in the Technical Advisory Committee.'"

CP Rail Intermodal Freight Systems

TORONTO, July 25, 1991

Our file: DEV-5-1.23 to 1.46
Your File: Application 2310

City of Toronto
Planning & Development Department
20E City Hall
Toronto, Ontario
M5H 2N2

Attention: Angus M. Cranston

Dear Sir:

Re: Application 2310 - Subdivision/Official
Plan/zoning By-Law Amendments
25 Old Bridle Path

We have reviewed the abovementioned proposal and wish to state our opposition to it. Residential development adjacent to the right-of-way is not compatible with Railway operations. The health, safety and welfare of potential residents could be adversely affected by Railway activities.

It is also noted on the Section 'C-C' incorporated on Plan No. 55T-91006, accompanying your letter of June 11, 1991 that the berm design would, if constructed, involve encroachments of Railway lands for the construction stage of the berm.

This aspect of the proposed development is deemed unworkable from our viewpoint, considering the disruption that would result in maintaining safe operating conditions on our rail lines. Another factor that would also tend to affect the proposal is the potential for the construction of two additional commuter railway lines through this area.

The Section 'C-C' also indicates the sight line vision of the prospective inhabitants of the development to the top of what is presupposed to be the vertical height of our railway cars. This dimension is shown as 3.75 metres. Currently rail traffic along this

corridor has a vertical height of 16'-9" but higher design heights may evolve for other type of Railway equipment. (i.e. - Commuter Cars).

However, should the application be approved, CP Rail requests that the following conditions be imposed on the development:

1. Berm, or combination berm and noise attenuation fence, having extensions or returns at the ends, to be erected on adjoining property, parallel to the Railway right-of-way with construction according to the following specifications:

- a) Minimum total height 5.5 metres above top-of-rail;
- b) Berm minimum height 2.5 metres and side slopes not steeper than 2.5 to 1;
- c) Fence, or wall, to be constructed without openings and of a durable material weighing not less than 20 kg. per square metre (4 lb/sq.ft.) of surface area.

No part of berm/noise barrier is to be constructed on railway property.

A clause should be inserted in all offers of sale and purchase or lease, and be registered on title or included in the lease for each dwelling affected by any noise and vibration attenuation measures, a restrictive covenant advising that any berm, fencing, or vibration isolation features implemented are not be tampered with or altered, and further that the owner shall have the sole responsibility for and shall maintain these features.

Dwellings must be constructed such that the interior noise levels meet the criteria of the appropriate Ministry. A noise study should be carried out by a professional noise consultant to determine what impact, if any, Railway noise would have on residents of proposed subdivision and to recommend mitigation measures if required. The recommendations of the study to be implemented.

2. Setback of dwellings from the Railway right-of-way to be a minimum of 30 metres. While no dwelling should be closer to the right-of-way than the specified setback, an unoccupied building,

such as a garage, may be built closer. The 2.5 metre high berm adjacent to the right-of-way must be provided in all instances.

3. Ground vibration transmission to be estimated through site tests. If in excess of the acceptable levels, all dwellings within 75 metres of the nearest track should be protected. The measures employed may be:
 - a) Support the building on rubber pads between the foundation and the occupied structure so that the maximum vertical natural frequency of the structure on the pads is 12 Hz;
 - b) Insulate the building from the vibration originating at the railway tracks by an intervening discontinuity or by installing adequate insulation outside the building, protected from the compaction that would reduce its effectiveness so that vibration in the building became unacceptable; or
 - c) Other suitable and adequate measures that will retain their effectiveness over time.
4. A clause should be inserted in all offers to purchase, agreements of sale and purchase or lease and in the title deed or lease of each dwelling, warning prospective purchasers or tenants of the possibility of alterations to or an expansion of its rail facilities thereon in the future, including the possibility that the railway may expand its operations, which expansion may affect the living environment of the residents notwithstanding the inclusion of noise and vibration attenuating measures in the design of the subdivision and individual units, and that the Railway will not be responsible for complaints or claims arising from the Railway's use of its facilities and/or operations.
5. Any proposed alterations to the existing drainage pattern affecting Railway property must receive prior concurrence from the Railway, and be substantiated by a drainage report to be reviewed by the Railway.
6. A 1.83 metre high chain link fence be constructed and maintained along the common property line of the Railway and the development, by the developer at his expense, and the developer is made aware of the necessity of including a covenant running with the lands, in all deeds, obliging the purchasers of the land


to maintain the fence in a satisfactory condition at their expense.

7. Any proposed utilities under or over Railway property to serve the development must be approved prior to their installation and be covered by the Railway's standard agreement.

To ensure the safety and comfort of adjacent residents and to mitigate as much as possible the inherent adverse environmental factors, your assurance that the above conditions will be imposed on the developer would be appreciated.

I would appreciate being advised of your decision regarding this proposal in due course.

Yours truly,


L. A. Clarke
Superintendent
EPK/aw

City of Toronto

Department of the City Clerk
City Hall
Toronto, Ontario
Canada M5H 2N2

Telephone: (416) 392-7020
Fax: (416) 392-6990
TDD: (416) 392-7354

Barbara G. Caplan
City Clerk
Sydney K. Baxter
Deputy City Clerk

Reply to: Mrs. Merle C. MacDonald - 392-7033
Please refer to: 91cncl 2-29:292

February 12, 1991

To: All Interested Persons

City Council, at its meeting held on February 4 and 5, 1991, gave consideration to Clause 29 contained in Report No. 2 of the Land Use Committee, entitled "Risk Assessment/Management Study - Rail Corridors in the City of Toronto".

During consideration of this Clause, Council also had before it the following report/communications:

- (January 22, 1991) from the Commissioner of Planning and Development;
- (January 28, 1991) from E. B. Freeman, North Rosedale Ratepayers' Association;
- (January 28, 1991) from S. Wilkinson, Vice-President, Swansea Area Ratepayers' Association;
- (January 25, 1991) from A. J. Healey, Chairman, Leacrest Road Action Committee;
- (February 4, 1991) from Harold Morrison, Chairman, M-Trac for Rail Safety;
- (January 30, 1991) from W. B. Granger;
- (January 30, 1991) from Dale Ritch;
- (February 4, 1991) from A. Milliken Heisey, Kerzner, Papazian, MacDermid, Barristers and Solicitors.


Council amended this Clause by adding at the end thereof the following:

"It is also recommended that the report (January 22, 1991) from the Commissioner of Planning and Development be adopted."

If you would like to receive a copy of this Clause, please contact this office.

Yours truly,


City Clerk

/bmk
IR

cc: Commissioner of Planning and Development
Commissioner of Buildings and Inspections
Commissioner of Public Works and the Environment
City Solicitor

CITY OF TORONTO CLAUSE EMBODIED IN REPORT NO. 2 OF THE
DEPARTMENT OF THE LAND USE COMMITTEE WHICH WAS AMENDED AND
CITY CLERK ADOPTED BY CITY COUNCIL AT ITS MEETING
 HELD ON FEBRUARY 4 AND 5, 1991

.....

29

**RISK ASSESSMENT/MANAGEMENT STUDY -
RAIL CORRIDORS IN THE CITY OF TORONTO**

The Executive Committee submits the communication (January 17, 1991) from Howard Joy, Chairman, Confederation of Resident and Ratepayer Associations:

We are deeply concerned with the disclosure by the Concord Scientific Corporation that a very high risk exists in the City of Toronto arising out of the heavy volume of dangerous goods moved by the railways through the heavily populated downtown corridors.

It is of particular concern that the highest risk is to be found in the Junction Triangle and in West Toronto where we see the possibility of a major disaster destroying hundreds of lives for the sole purpose of making it easier and cheaper for the railway to transport these volumes of chemicals through the shortest route and at the lowest costs. Most of this traffic does not start or stop in Toronto; the City is simply a shortcut to get the product to Montreal or Winnipeg or Vancouver with the increased use of the classification yard in Agincourt.

The Commissioner of Planning and Development has asked your Committee to decide on a level of risk assessment which may be acceptable to the City of Toronto in the light of the Concord Scientific Corporation report. As we understand it, out of this acceptable standard or risk will flow setbacks and other means of reducing the existing risk from train derailments, explosions, fires, ruptures and leaks. We can see the need for urgent attention to this matter in the light of reports that the Federal Government, which has primary responsibility in the regulation of the national railways and the maintenance of public safety, has shown laxity to the point where dangerous goods rail accidents across the country are increasing.

Until the matter of relocating the dangerous goods rail traffic can be resolved by providing the residents with the highest standard, namely, the risk of 1 death in a million. At the very least, if the City cannot provide that level of protection, we should set a minimum standard of 10 in a million, with additional safety measures in West Toronto to achieve that standard, which, we understand, is no more than the protection provided in Toronto in handling the general fire hazard.

The Land Use Committee recommends:

1. That Council recognize and affirm that the legal and moral responsibility for the safe operation of the rail transportation system lies with the railway companies, the Federal Government, and its agencies responsible for the issue of rail safety;
2. That Council reaffirm its position that the movement of hazardous goods not destined for the City of Toronto should be rerouted outside the City limits.
3. That Council adopt the risk levels used by the U.K. Health and Safety Executive outlined in the report (November 21, 1990) from the Commissioner of Planning and Development, i.e. 10 in 1-million;

4. That appropriate Officials report to the Committee no later than June, 1991, on implementation strategies for other safety measures identified in Section 5.3 of the Concord Study, for areas of the City bordering segments of the tracks having a risk of over 10 in a million.
5. That appropriate Officials report to the Committee no later than June, 1991, on the changing land use patterns along railway corridors insofar as they affect risk levels.

The Committee reports having requested the Commissioner of Planning and Development, in consultation with the Consultant, to report directly to Council on the following motions by Councillors Maxwell and Walker, which were placed but not voted on:

Moved by Councillor Maxwell,

That setbacks from rail corridors be determined on a site specific basis for new development applications.

Moved by Councillor Walker,

That setbacks for rail corridors be determined, and that mitigating measures be determined on a site specific basis for existing or new developments.

Mr. Ron Portelli of Concord Scientific Corporation, gave a presentation on the highlights of the "Risk Assessment/Management Study of Rail Corridors in the City of Toronto".

The following persons addressed the Committee respecting this matter:

- *Harold Morrison, President, Metro Toronto Residents' Action Committee for Rail Safety*
- *Ted Larkin, Moore Park Residents' Association*
- *Barry De Zwaan, Summerhill Residents' Association*
- *John Tyacke, Summerhill Residents' Association*
- *Doug Paton, President, Avenue-Bay-Cottingham Residents' Association*
- *Ed Freeman, Director, North Rosedale Ratepayer's Association*
- *Metro Councillor Bossons*
- *Linda Bergman, Cottingham Square Community Association*
- *Connie Briant, South Rosedale Ratepayers' Association*
- *Mark Macdonald*

The Committee submits the report (November 21, 1990) from the Commissioner of Planning and Development:

Subject: Risk Assessment/Management Study of Rail Corridors in the City of Toronto

Origin: Commissioner of Planning and Development (c71luc90709:61)

Recommendations:

1. That your Committee schedule a special evening meeting for a presentation by the consultant of the Risk Assessment/Management Study of Rail Corridors in the City of Toronto.
2. That depositions be heard on this matter at that meeting.
3. That the City Clerk be requested to provide notice of the meeting in City newspapers.
4. That a nine (9) page Executive Summary of the study be provided by the City Clerk to interested persons free of charge upon request.
5. That subsequent to the hearing of depositions, your Committee choose one of the following risk levels as an acceptable level of risk so that I can report further on appropriate risk reduction measures:

- a) 1 in a million
- b) 10 in a million
- c) 100 in a million

Comments: On May 6, 1988, City Council instructed the Commissioner of Planning and Development to proceed with a risk assessment/management study for rail corridors in the City.

Subsequently, on October 3, 1988, City Council authorized the hiring of Concord Scientific Corporation to undertake this study in accordance with terms of reference prepared by my Department (Land Use Committee Report No. 18, Clause 30).

Mr. Ron Portelli, of Concord Scientific Corporation, has now submitted the requested study entitled "Risk Assessment/Management Study of Rail Corridors in the City of Toronto", (125 pages plus appendices). I now forward reference copies to the Administrator, Land Use Committee, for use by Members of City Council.

In terms of distribution of the study results, I have provided the City Clerk with a nine (9) page Executive Summary to be made available to interested parties upon request. I have also made the full study available on a reference basis in selected Public Libraries throughout the City. Finally, full copies of the study will be available in the New Year from the Resource Centre, Information Services Section, Department of the City Clerk.

I am now recommending that a special evening meeting of your Committee be held for a presentation of the findings by the consultant. This is necessary to fully understand this complex and technical study.

I am also recommending that deputations be heard on this matter at that meeting and that the City Clerk be requested to provide notice of the meeting in City newspapers. This method of notice reflects the fact that the results of this study have City-wide implications and are not confined to any particular community.

Finally, I am recommending that your Committee at the end of the meeting choose an appropriate level of safety to be strived for so that I can report further on appropriate implementation measures. This matter requires some further explanation as discussed below.

Risk and Safety

The study, among other matters, assessed the risk to the public from the potential release of hazardous substances from railroad operations in the City of Toronto. A key measure of risk used in the study is "individual risk." Individual risk is defined as the frequency of harm to which an individual is exposed from a specific hazard or combination of hazards. In the study, individual risk is expressed as the probability of death per year for an exposed individual.

Table 1 shows the probability of death for an individual in any one year for a variety of common accidental causes of death, such as motor vehicle accidents and falls. Table 2 shows what this study has calculated to be the probability of death for an individual in any one year associated with a railway hazardous goods accident at different distances from specific rail corridors in the City of Toronto.

A comparison of the two tables is revealing and assists with understanding risk levels associated with hazardous goods railway traffic within the City. For example, the highest level of individual risk in Table 2 is associated with segment 2 (Junction Triangle Area) where the risk is 86 chances in a million per year at 40 metres from the railway tracks. This level of risk is slightly more than the individual risk of death per year from falls in Canada. At 110 metres from the track, the level of risk corresponds to the individual risk of death per year from fires in Canada. The level of risk drops to 10 in a million at about 150 metres and to 1 in a million at about 450 metres from the railway line.

While the study exhaustively documents measures of risk, it does not make any decisions with respect to the acceptability of risk (safety), which is based on personal and social value judgements. Essentially, based on the information presented in this study, it is the responsibility of City Council to decide what is an acceptable level of public risk.

While guidelines or criteria on the acceptability of public risk from hazardous facilities do not exist in Canada, some guidance is provided in the study based on other sources (see pages 4-1 to 4-4). For example, the U.K. Health and Safety Executive uses the following guidelines:

Risk of Death Per Year (Chances in a Million)

100 in a Million (1 IN 10,000)	Intolerable Risk Level
10 in a Million (1 in 100,000)	Upper Bound Risk Level if Number of People Greater Than 25
1 in a Million	Lower Bound Risk Level "Negligible Risk"

The foregoing criteria from the U.K. have been cited because of its extensive experience in risk assessment. Generally, it appears that 10 in a million is the most commonly accepted guideline for acceptable individual public risk.

Next Steps

There are a number of means of alleviating the risk to the public from the movement of hazardous goods along rail corridors in the City of Toronto. These range from rerouting all such traffic elsewhere, to allowing limited hazardous goods traffic in conjunction with risk mitigation measures such as setbacks, track improvements, emergency evacuation procedures and so on. These can only be decided upon, however, once an acceptable level of risk is determined. For example, if Council determines that 100 in a million is to be considered an acceptable level of individual public risk, then hazardous goods rail traffic movement at current levels within the City is generally safe and requires few mitigative risk reduction measures. If, on the other hand, 1 in a million is considered the only acceptable level of risk, then it is difficult to envision enactment of mitigative measures short of complete removal of hazardous goods traffic from all rail corridors in the City.

In any case, the level of risk selected as acceptable may not be immediately achievable, and therefore should be viewed as a goal to be worked towards. Hence, the level of acceptable individual risk is important because it establishes a quantitative measure for assessing progress toward achieving a desired level of safety.

I therefore require guidance from your Committee on this matter before I can report further on the ramifications of the study in terms of appropriate risk reduction measures. I suggest that this decision not be made until the full study results are presented by the consultant and the public is heard on this matter.

—
Table I

Some Common Risks in Canada and Metropolitan Toronto

Cause or Hazard	Individual Risk (chances in a million of death per year)	
	Canada(1)	Metropolitan Toronto(2)
Motor Vehicle Accident	159	75
Falls	75	102
Fires	20	12
Poisoning	15	28
Excessive Cold	4.4	N/A
Cataclysmic Storms	0.3	0
Lighting	0.2	0

Table 2
Estimated Maximum Levels of Individual Risk
at 10, 40, 60 and 110 m From Rail Lines

Rail Segment	Maximum Individual Risk (chances in a million of death per year)			
	10 m	40 m	60 m	110 m
1	85	43	20	10
2	115	86	53	21
3	35	16	14	4.3
4	11	7.6	4.1	1.1
5	9.9	7.5	3.3	0.3
6	2.3	0.8	0.2	0.03
7	5.3	1.1	0.8	0.1
8	5.4	1.2	1.0	0.2
9	6.0	1.4	1.2	0.3
10	7.9	3.8	1.4	0.3
11	7.5	3.4	1.3	0.3
12	9.9	7.6	3.3	0.2
13	2.5	0.8	0.3	0.02

Source: Risk Assessment/Management Study of Rail Corridors in the City of Toronto, Concord Scientific Corporation, (pg 4-5 and pg 4-14).

(Executive Summary (September, 1990) prepared by the Concord Scientific Corporation for the Planning and Development Department, entitled "Risk Assessment/Management Study of Rail Corridors in the City of Toronto")

This study has been conducted on behalf of the City of Toronto to assist its Planning and Development Department in its examination of suitable land use regulatory measures for rail corridors, which incorporate public safety/risk considerations. The intent of this investigation was to extend the large area risk assessment and management study undertaken in 1986-87 for the Toronto Area Transportation of Dangerous Goods Task Force, focusing on the specific hazards to the public posed by dangerous goods (DG) and non-DG rail traffic within the City of Toronto. The primary focus of this report is the risk to the public due to DG rail traffic within the City, particularly along the main freight corridor (the CP Galt and North Toronto railway subdivisions).

The study commenced with data collection and identification of key situations in the City where public safety is threatened by potential rail transportation accidents and existing land uses adjacent to rail corridors. The identified sites and hazards were reviewed in conjunction with City officials and its Technical Advisory Committee and they fall into two categories: fixed hazardous facilities having the potential to escalate the consequences of a railway accident (the so-called "knock-on effect") and public facilities of key concern being those particularly vulnerable to rail accidents, such as schools and senior citizens' residences. Along the main freight corridor, nine fixed hazardous facilities were identified, of which six were selected as representative industrial land use facilities involving DG's; and, six public facilities of key concern were identified, of which four were selected as representative of high density and vulnerable residential land use facilities. The selected sites were used as representative land uses for valuation of the lands with respect to possible set-back distances.

The potential consequences of a rail accident near these 15 fixed hazardous facilities and public facilities of key concern have been discussed in qualitative terms. Quantitative analyses of potential knock-on effects were not within the scope of this study. And while quantitative analyses were also not required for the risks specific to each public facility, detailed population data in the area of all 15 key facilities were used, for the quantitative estimates of public risk from DG rail transport accidents.

A quantitative analysis of risk from DG rail transport was conducted for the approximately 96 km of rail network carrying DG trains within the City limits. The risks were analyzed on the basis of 13 rail segments comprising four corridors in the rail network as shown in Figure 2-1:

- Corridor I (Segments 1, 2 and 3): the main freight corridor running west-east in the north of the City consisting of the CP North Toronto and Galt subdivisions.
- Corridor II (Segments 8, 10, 11 and 13): the main passenger corridor running west-east in the south of the City consisting of the CN Oakville and Kingston subdivisions.
- Corridor III (Segments 4, 5, 6, 7 and 9): the roughly north-south corridor in the west of the City consisting of the CN Weston and Newmarket subdivisions as well as the CP Galt and McTier subdivisions.
- Corridor IV (Segment 12): the north-south corridor in the east of the City consisting of the CN Bala and CP Belleville subdivisions.

Estimates of individual and societal risk were made for each rail segment as well as the entire network. The measure of risk was taken as immediate death as is the practice in such risk studies. Delayed deaths or sub-lethal effects from exposure to hazards were not considered in the quantitative analysis. Residential and employment population data used were from 1988, and transients (visitors and commuters) were not included. Data on railroad accident frequencies and DG rail traffic volumes were the same as 1985 data employed in the Toronto Area Rail Transportation of Dangerous Goods Task Force risk assessment by Concord Scientific Corporation, except for the CP rail traffic data which was revised based on its 1988 traffic movements which are more representative of current operations.

The societal risk or the overall risk to the public from DG rail transport within the City was estimated at 0.322 fatalities per year (or 1 fatality per 3.1 years). A similar study for the City of Denver in 1987, estimated a comparable level of societal risk of 0.278 fatalities per year (or 1 fatality per 3.6 years). These levels of societal risk, when compared to common societal risks, were shown to be relatively small for both cities. The average individual risk of fatality for the City of Denver, with a population of approximately 500,000 was given as 0.56 chances in a million per year which is also comparable to the estimate of 0.5 chances in a million per year for the City of Toronto, with a population of about 608,000.

While the overall societal risk is relatively small, some regions of the City bear much higher risks than do others. On examining societal risks on a segment-by-segment basis, it was shown that the highest levels of societal risk are posed by rail segments along the main freight corridor. The societal risk rate along the highest risk segment is about 90 times higher than that along the lowest risk segment. Of the estimated overall societal risk due to DG rail transport in the City, the three rail segments of the main freight corridor account for 41%.

Profiles showing the estimated levels of individual risk as a function of distance from the rail line were produced for all rail segments. The estimated values of maximum individual risk of fatality are below 100 chances in a million per year (a relatively high risk level, comparable to the individual risk of falls in the City) for all rail segments except those along the main freight corridor, where within 30 m of segment 2, levels of individual risk reach 100 to 115 chances in a million per year. Only rail segments 1 to 4 pose individual risk of fatality of greater than 10 chances in a million per year at the edge of the railway right-of-way (approximately 10 m from the rail line). All rail segments pose individual risk of fatality of greater than 1 chance in a million per year at the edge of the railway right-of-way.

When the evaluating estimates of risk, it is important to bear in mind that there are uncertainties in making such estimates. The uncertainty in the mortality risk values presented in this report are considered to be in a range from a value of two times higher to a value of ten times lower than the estimate given. For example, an individual risk estimate of 10 chances in a million per year could lie in the range of 20 to 1 chance in a million per year. It should also be noted that the risk estimates provided are based on the specified DG traffic volumes and population (which does not include transients (i.e., non-residents, commuters and visitors). Any significant changes to these two primary

determinants of public risk would produce significant changes to the risk estimates. As the DG traffic volumes and the resident population of the City of Toronto are not expected to change significantly in the foreseeable future, the risk estimates presented in this report are considered reasonably representative of existing and near-future conditions.

Judgments about the acceptability of risk are personal and social value judgments that can only be made by the public exposed to the risk and their elected representatives in government. To assist decision-makers and other parties concerned with evaluating the acceptability of the estimated levels of risk, data were compiled on common involuntary risks in the City and some criteria on acceptability from the literature and other jurisdictions are provided. As the field of risk analysis is relatively young, no universally accepted risk criteria exist, and in Ontario and Canada as a whole, no formal risk guidelines or standards have been adopted. Experience is building, however, as many jurisdictions are facing public risk management decisions. Consensus is forming that levels of individual risk of death per year of less than one chance in a million are not significant. With regard to upper bounds on the acceptability of individual risk per year, the level of 10 chances in a million appears to be receiving increasing attention and has been adopted in some jurisdictions.

The use of setbacks, as a risk mitigation, were shown to provide significant levels of risk reduction. Compared to a setback of zero metres (roughly 10 m from rail line), setbacks of 30 to 100 m were estimated to reduce maximum levels of individual risk by 25 to 88%, along the main freight corridor. Given the existence of 30 m setbacks, the reduction in maximum individual risk was estimated to be 13 to 77% through implementation of 50 to 100 m setbacks along the main corridor. The corresponding percentage reductions in societal risk were estimated to be 40 to 76%.

Costs to implement setbacks along the main freight corridor were estimated based on land valuations using three categories of development: industrial, residential and commercial. The land valuations are based on an analysis of the expected market value of the property from putting it to its highest and best use. Therefore, the estimated costs should be viewed as "lost opportunity costs" to the landowners. These cost estimates given below are based on 1989 values and are considered approximate.

Setback Distance M)	Cost (\$ Millions)			
	Industrial	Residential	Commercial	Total
30	9	71	142	222
50	23	161	499	683
100	85	324	1,916	2,386

Therefore, to implement a 30 to 100 m setback for all developments along the entire corridor would cost in the range of \$220 million to \$2.4 billion. While not a requirement of this study, it should be noted that no analysis has been done on the benefits that would accrue to the City from added land values were relocation of the rail lines to take place as opposed to implementation of setbacks as the measure for risk mitigation.

A review of studies pertaining to the objectives of the present investigation is presented for four Canadian cities: Regina, Calgary, Vancouver and Toronto; and two U.S. cities: Seattle and Denver. While the issue of public risk from rail transportation has been examined in one form or another in these studies, no DG risk-based setbacks have been adopted in the Canadian cities. The City of Regina has implemented a municipal by-law stipulating a 300 m setback (buffer zone) for residential development, based, however, primarily on noise abatement considerations. The Denver study as found to be the most relevant of the studies reviewed and a 30 m setback as recommended in this study to reduce levels of individual risk to less than once chance in a million per year. A detailed examination of other risk mitigation measures was also undertaken in this study.

For the authors of this report to make firm recommendations to the City regarding the sizes of setbacks that should be implemented would not be appropriate, as this would require value

judgments to be made on the levels of risk which would be acceptable to the public. These are social value judgments that can only be made by the public or their elected representatives. This report has documented the risk estimates and some common City risks and risk criteria from other jurisdictions have been provided to assist City officials and other interested parties in evaluating the acceptability of the estimated risks.

In order to satisfy the requirements of this study and provide recommendations for risk reductions with respect to setback distances, without making the above-noted value judgments nor making assumptions as to the risk criteria that City Council might adopt, a range of options has been prepared for the main freight corridor in consultation with the City's Planning and Development Department. They are as follows in order of increasing risk reduction:

- Option 1A: 30 metre setback from right-of-way for residential developments and places of assembly (i.e. schools)
- Option 1B: 30 metre setback from right-of-way for all development (industrial, commercial, residential)
- Option 2A: 50 metre setback from right-of-way for residential development and places of assembly
- Option 2B: 50 metre setback from right-of-way for all developments
- Option 3A: 100 metre setback from right-of-way for residential development and places of assembly
- Option 3B: 100 metre setback from right-of-way for all development

The lost opportunity costs for these options range from about \$76 million for Option 1A to \$2.4 billion for Option 3B. The reductions in risk vary for Segments 1, 2 and 3 of the main freight corridor and they are given in Section 5 of the report. In general, setbacks of 30 to 100 m were estimated to reduce maximum levels of individual risk along the main freight corridor by 25 to 88% compared to the case of a setback of zero metres (roughly 10 m from rail line).

No setback option has not been presented, given that some parts of the main freight corridor have estimated levels of individual risk of fatality of greater than 100 chances in a million per year. Such levels are generally considered high and other jurisdictions appear to be adopting 10 chances in a million as an upper bound on acceptable individual risk.

With regard to segments 4 through 13, a setback of 30 m may be a suitable setback for the City to consider since it would reduce levels of individual risk to generally well below 10 chances in a million per year and is consistent with railway policy. Cost estimates for setbacks along these segments was not a requirement of this study.

However, for the main freight corridor, it is recommended that other risk mitigation measures be seriously considered in addition to setbacks, which even at 100 m would not reduce estimated maximum levels of individual risk to below 10 chances in a million along the entire corridor. A general and qualitative discussion of the following other forms of risk mitigation is presented in the report: land-use restrictions; barriers or barricades; tunnels; time-of-day scheduling; rerouting; speed restrictions; improved training of rail and emergency response personnel; inspection programs for rail cars and railway track and bed conditions; drainage controls; and increased protection at level crossings. The first measures that should be considered are those that are directly within the control of the City, such as land-use restrictions, barriers and drainage controls. A detailed examination of these and other risk mitigation measures would need to be undertaken before site specific recommendations could be made.

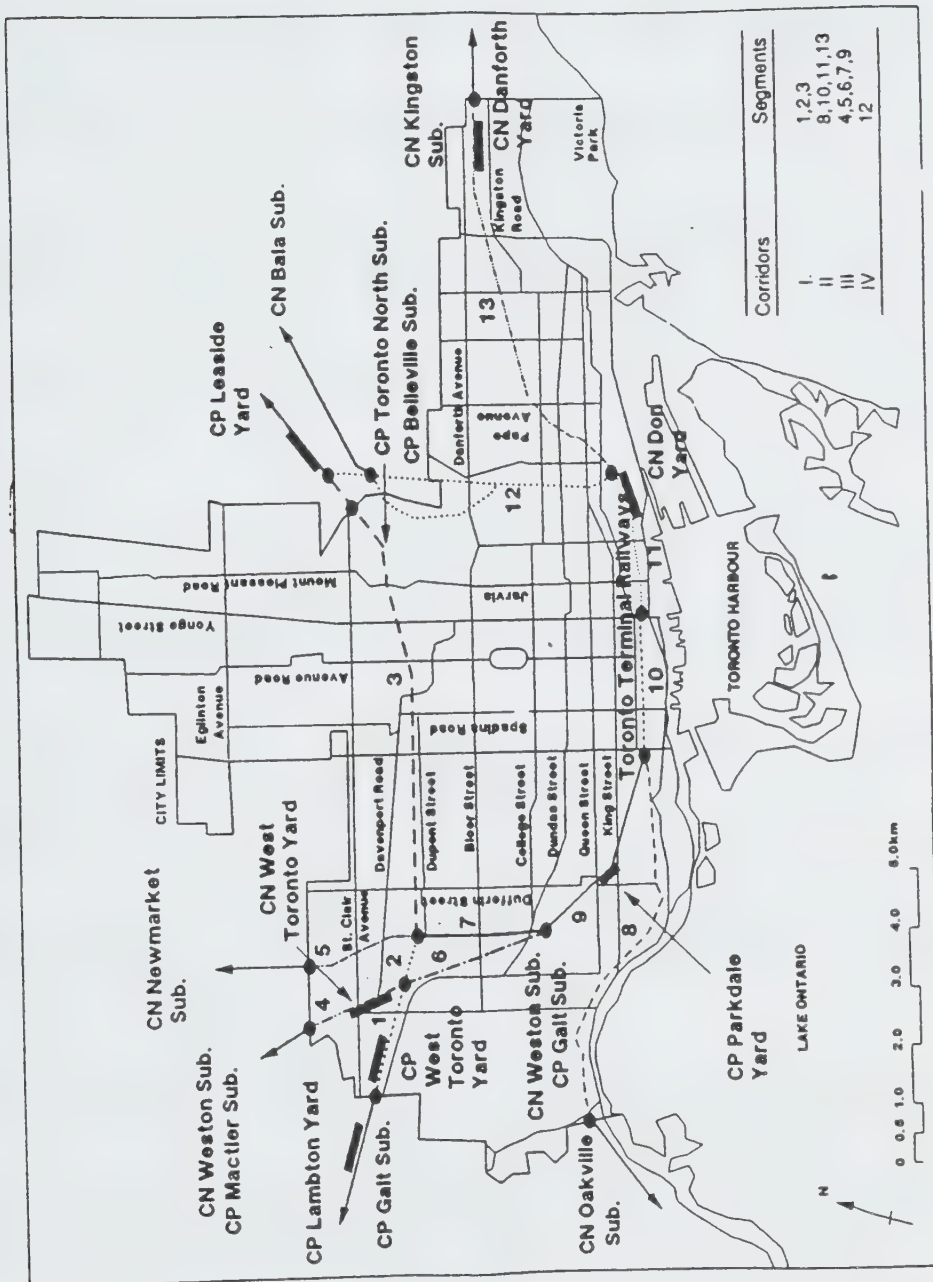


FIGURE 2.1 CITY OF TORONTO STUDY AREA AND RAIL SEGMENTS

Concord Scientific Corporation

(Copy of the entire report dated September, 1990, entitled "Risk Assessment/Management Study of Rail Corridors in the City of Toronto prepared by Concord Scientific Corporation, is on file in the City Clerk's Department.)

The Committee also submits the joint communication (January 16, 1991) from Councillors Maxwell and Levine:

Recommendations:

1. That Council recognize and affirm that the legal and moral responsibility for the safe operation of the rail transportation system lies entirely with the railway companies.
2. That Council reaffirm its position that the movement of hazardous goods not destined for the City of Toronto should be rerouted outside the City limits.
3. That Council adopt the risk levels used by the U.K. Health and Safety Executive outlined on Page 3 of the report dated November 21, 1990, from the Commissioner of Planning and Development (i.e. 10 in 1 million).
4. That setbacks from rail corridors be determined on a site specific basis for new development applications.*
5. That staff report on implementation strategies for other safety measures identified in Section 5.3 of the Concord Study.
6. That staff also report on the changing land use patterns along railway corridors insofar as they affect risk levels.

* Risk levels which may be associated with setback distances can vary dramatically by site. Certain land uses increase risk more than others. As a result, it is not advisable to adopt one standard setback distance for the entire city.

The Committee also submits the communication (December 7, 1990) from Harold Morrison, Chairman, Metro Toronto Residents' Action Committee (M-TRAC):

1. We wish to commend the Commissioner of Planning and Development on his handling of this very serious yet highly technical issue arising out of the heavy flow of dangerous chemicals by rail through the high-density downtown core.
2. We agree that an acceptable standard of risk must be established before reasonable setbacks can be set. In view of the number of rail incidents reported recently in and around the Metro Area, it is a matter of some urgency that the thousands of Toronto residents at risk be provided with the maximum protection.
3. The Land Use Committee will recognize that the City of Toronto, as well as Metro Toronto, advocate the transfer of the dangerous goods rail traffic from the downtown core into a safe corridor away from the public. Alternative routes have been explored by the Toronto Area Rail Transportation of Dangerous Goods Task Force.
4. Until such transfer takes place, setbacks and regulated rail speeds will provide some means of reducing the risks which, the Risk Assessment Study points out, are very high in some areas of the downtown core. To consider that a plume from a ruptured chlorine car can cause 8,000 deaths is totally unacceptable.
5. The need for setbacks is fully supported by the Toronto Fire Department and by the Metro Toronto Emergency Response Co-ordinator. It may be of interest to the Committee that the Marathon Lands Working Committee which has studied the proposed Summerhill development for more than a year feels it is essential to demand a 30-metre setback from the right of way as a matter of top priority.

The Committee also submits the communication (January 14, 1991) from Ms. S. H. Armstrong:

I have been following the Concord Scientific Study for some time and I was distressed when the 50-metre setback policy of the City of Toronto was removed.

The Concord Study points out that indeed the risk to the public living and working adjacent to the North Toronto Sub-Division is indeed high, very high in some cases. It is clear that City Council must act and bring about appropriate risk reduction measures until this dangerous goods rail traffic is relocated.

I continue to hear of increasing dangerous goods rail accidents across Canada and I worry about a repeat of Mississauga I, Don Mills and Mississauga II; all train derailments on this particular rail line.

It seems that an individual risk of ten in a million is not an unreasonable standard to be applied in this situation and I note that it is commonly accepted in the United Kingdom by the Health and Safety Executive. I also note that this proposed ten in a million standard is close to the Metropolitan Toronto fire risk.

I urge you to adopt the Planning Commissioner's report and request that you adopt a ten in a million standard.

The Committee also submits the communication (January 14, 1991) from Metro Councillor Bossons:

The CPR tracks bisecting Toronto's Midtown are those on which the 1979 Mississauga rail disaster happened, forcing North America's then largest civilian evacuation; on which 24 freight cars derailed in Mississauga in 1990; on which in 1987 three locomotives and 31 cars derailed at Don Mills and Eglinton. These tracks carry, yearly, over 20,000 carloads of dangerous and special-dangerous commodities - which can explode and/or burn and/or corrode. Derailments, yard accidents - and risks - are steeply on the increase.

Acceptable risks:

While a lower risk probability would be desirable, I believe it is realistic to set a risk probability of 10 in a million. It is a risk level similar to that accepted in the U.K. and the Netherlands. It is similar to the 12-in-a-million risk we face from fire in our community.

Why risk probability should not be higher than 10 in a million?

The Concord Scientific risk assessment study is relatively static: It has not taken into account the day-time population of the neighbourhoods at risk. The CPR tracks cross two subway lines and several roads dense with rush-hour traffic, leading to several of Toronto's major hospitals. Nor are the broader environmental effects of a chemical derailment.

Land Use rules, mitigating measures - until CPR traffic relocated:

It would be in CPR's best interest to route this freight traffic more directly and to avoid the risk of horrendous insurance claims by routing it through less densely populated areas. In the meantime, Toronto's land use policies must firmly reflect the 10 in a million risk of serious accident. In the meantime, also, Toronto should be firm in insisting on a maximum of mitigating measures that will lower the fallout from serious accidents: setbacks, barriers, speed controls, improved procedures for railway operations, disaster and evacuation planning.

The Committee also submits the communication (January 14, 1991) from Phyllis L. Scandrett:

Having followed the Concord Scientific Study for some time, I, and my family, were distressed to hear the 50 metre setback policy was removed.

We are all very worried about the danger of derailment knowing these trains carry all sorts of dangerous goods. Living on our street one is only too well aware of the number of trains in each 24-hour period and the speeds at which they travel.

I urge the City Council to act and bring about appropriate risk reduction.

The Committee also submits the communication (January 16, 1991) from Wm. B. Granger:

Please enter this correspondence into the record of the public meeting to be held on January 17, 1991. I am unable to attend as I am teaching at York University that evening.

I have read Commissioner Millward's report dated November 21, 1990, and the Concord Scientific Corporation document dated September 1990. I believe that a 1-in-a-million individual risk level would be a laudable goal, but that a 10-in-a-million calculated risk level for residents nearest the Rail Corridors is a more attainable objective.

It is imperative that at least the 10-in-a-million risk level be adopted by Land Use Committee and Council so that this essential standard will provide the basis for future planning in Toronto. This standard, once adopted, will provide a solid grounding for the City staff and Neighbourhoods Committee to develop and adopt future required setbacks, and other mitigative measures. It is my hope that these actions will lead to reasonable setbacks, barrier walls and site specific mitigation in all future development, leading to modifications to the Official Plan and Zoning By-laws.

Thank you for this important initiative.

The Committee also submits the further communication (January 17, 1991) from Mr. Harold Morrison, Chairman, Metro Toronto Residents' Action Committee (M-TRAC):

1. In view of the rising number of dangerous goods rail accidents across Canada it is apparent that the threat of another major incident in the Toronto area has increased. The frequency and volume of dangerous goods rail traffic in the Toronto area is the heaviest in the country.
2. The study undertaken by the Concord Scientific Corporation indicates there are very heavy areas of high risk along the North Toronto Subdivision where a federal task force report warns of very high fatalities in the event of a chemical tank car rupture.
3. Obviously, the best solution is to remove the dangerous goods rail traffic into a safe corridor, away from the public, and various alternative routes have been explored by the federal task force under Mr. Harold Gilbert, former Ontario Deputy Minister of Transport.
4. With the exception of a mandatory rail speed restraint, very little has been done to reduce the existing high risk for thousands of Toronto residents. Metro Council and Toronto City Council have called for relocation of the dangerous goods traffic but the Federal Government has not responded with sufficient determination to bring this about.
5. The responsibility therefore rests on the City of Toronto to find some means of reducing the suffering and damage that might result from a dangerous goods derailment that would bring death and injuries and force thousands of people from their homes. Schools and other institutions along the track are also at risk. It is clear from the Concord study that action to reduce this risk is urgent. The federal safety net has not improved; it has worsened. The number of dangerous goods rail accidents across the country increased in 1990 over 1989 and we point to the lax federal attitude as part of the cause.
6. Establishing a reasonable setback for new residential, institutional and commercial construction is one means of reducing the risk. It provides a buffer between the home and school and what goes in inside the rail right-of-way and enhances the possibility of escape from incidents where fumes, leaks and lateral displacement spreads damage from rail accidents to adjoining land. Buffers also allow emergency response forces easier and quicker access to the accident site.
7. The question to be resolved is how much safety should this buffer provide. You have before you a request by the Commissioner of Planning and Development to decide whether the risk level should be 1 in a million, 10 in a million or 100 in a million. Perhaps 1 in a million would be ideal, providing residents and institutional occupants with a relatively highly acceptable protection, whereas 100 in a million would be an outrageously low rate of protection. It would mean that we would allow out of a million population 100 to die in the event of an accident. Publicly-minded authorities would not find that acceptable.

8. What appears more reasonable is the middle ground of 10 in a million, which, we understand, is about the same risk rate in the design of fire protection in the Toronto area. In most parts of the rail corridors this could be accomplished by a 30-metre setback from the right-of-way, a setback considered the very minimum by federal experts studying ways of mitigating the results of a possible chemical disaster in Canada.
9. In some parts of the rail corridors, particularly in West Toronto, 30 metres may be insufficient to meet the needs of a 10 in a million risk rate and other associated measures may be needed. But on the whole 30 metres would be the very minimum for the general population safety and we would hope that this Committee will agree with this suggestion.
10. At the same time we believe it is essential that this Committee express the determination of the City of Toronto to pursue relocation of the dangerous goods rail traffic away from the high density downtown area and once again call on the Federal Minister of Transport to accelerate progress towards this goal. It is, of course, not the fault of the City of Toronto that this rail risk has been thrust upon it. But the risk is there, nonetheless, and it is up to the City of Toronto to protect its people as best it can. Accepting the principle of a minimum 30-metre setback until the dangerous goods rail traffic can be removed will help demonstrate the good faith of City Council in fulfilling this protection need.

(Article appended to the foregoing communication is on file in the City Clerk's Department.)

(Communication dated January 7, 1991, from the Chairman, M-TRAC, addressed to The Honourable Doug Lewis, Minister of Transport)

It has been brought to our attention that tank cars, containing dangerous goods, have been operating in the general Toronto area bearing misleading placards, thereby falsely identifying the true nature of the contents.

We had a serious situation in 1984 when Federal authorities discovered that tank cars marked Empty contained large quantities of a dangerous product backfilled at high pressure. Orders were struck to change the Empty placard to Residue and to ensure that tank cars carrying large quantities of dangerous product are properly placarded Loaded.

It is generally understood that dangerous goods tank cars marked Residue contain not more than two per cent of the original load. The risk that emergency response forces may jeopardize their own lives and those of nearby residents by misunderstanding the quantities of dangerous goods in a crippled or derailed tank car increases with the false reporting of the car's contents.

We had hoped that your Rail Safety and Dangerous Goods Directories would have the matter under control but we have no assurance that this is the case. We have raised concern about the storage of dangerous goods tank cars in built-up areas without locked switches and set brakes or adequate supervision for weeks and months at a time and we have been given assurance that this would be rectified, only to find the slovenly and dangerous practice continuing.

We are deeply concerned about the complaints we have received from anxious municipalities and residential groups, especially with the rise of dangerous goods rail accidents in 1990. It is becoming increasingly apparent that we may be heading toward an unnecessary disaster because of the lack of positive safety actions by the directorates concerned.

(Material appended to the foregoing is on file in the City Clerk's Department).

The Committee also submits the communication (January 17, 1991) from Ted Larkin, Vice-President, Moore Park Residents' Association:

The Moore Park Residents' Association has reviewed the findings contained in the summary of the Concord Scientific Corporation study on the risk assessment of rail corridors in the city of Toronto and the submission from the Commissioner of Planning and Development dated November 21, 1990.

Our neighbourhood borders the CP Rail North Toronto Subdivision, which carries the bulk of dangerous goods traffic through Toronto. It is our association's recommendation that City Council should adopt a guideline for acceptable individual public risk of "ten in a million".

To achieve this level of risk in our community, it is the position of the Moore Park Residents' Association that a 50 metre setback from the railroad's right-of-way be adopted for residential development and places of assembly.

The Committee also submits the communication (January 17, 1991) from Doug Paton, President, ABC Residents' Association:

ABC Residents' Association serves the area from Bloor Street to the CPR tracks, between Avenue and Yonge Street.

Many ABC residents, including myself and my family who have lived on Marlborough for many years, have enjoyed a kinship and love of the trains which pass our homes frequently day and night. But the Mississauga derailment made us aware of the dangers of living so close to the railway. The very cars which derailed in Mississauga were minutes away from downtown Toronto and the ABC area.

The CPR tracks come within a few meters of Marlborough Place and Macpherson Avenue at Avenue Road. Houses are close together, and a large population lives very close to the railway line. Area children attend Cottingham School on Birch Avenue, located right on the CPR tracks on the north side.

The tracks are on a steep incline at Avenue Road and Marlborough, and the houses are close to the tracks. A derailment there would be very serious; derailment of a train with dangerous goods would be a disaster.

In view of the dangers to residents and school children, we believe that carriage of dangerous goods on this line must be kept to a minimum, with only those goods with a Toronto destination carried through the city. At the very least, safety of residents demands that low speeds for all trains must be maintained through the highly populated Toronto area.

ABC Residents' Association continues to support the M-TRAC position of a minimum 30 to 50 meter setback, which would offer some protection in the event of a derailment.

We gratefully acknowledge the work done by M-TRAC to research information on the railway and keep the issue of railway safety before the public.

The Committee submits the communication (January 17, 1991) from E.B. Freeman, Director, North Rosedale Ratepayers' Association:

Re: Need for Setbacks - Concord Scientific Corporation Risk Assessment and Management Study.

The North Rosedale Ratepayers' Association represents a neighbourhood that forms part of the high-risk area threatened by the constant flow of large volumes of dangerous goods by rail.

We desire that the City provide our neighbourhood, as well as other neighbourhoods at risk, with as much protection as possible. The Concord Scientific Corporation study indicates that the problem is serious and that some action must be taken to reduce the risks.

The question before you is what measurement of risk is to be accepted. Of the three measurements placed before you by the Commissioner of Planning and Development, it would seem that the maximum protection would be 1 in a million and the lowest protection would be 100 in a million. However, the large differences in costs to obtain the different levels of risk lead us to compromise on the middle ground and urge that at the very least the measurement of 10 in a million be accepted to provide us with protection somewhat equivalent to that provided against the risk of fire.

We understand that a 30 m setback from the railway right-of-way would assist in implementing the 10 in a million risk measurement, and that a 30 m setback is fully supported by the Toronto Fire Department and by the Metro Toronto Emergency Response Coordinator. Therefore, we urge that a 30 m setback be applied on all new residential and commercial construction where large numbers of people would be present for extensive parts of the day.

As train cars increase in length and capacity, the potential risks associated with derailments expand farther and farther from the railway right-of-way. Freight cars 40 and 50 feet long, formerly the norm, are now commonly 60 feet or longer - a setback is required. A setback less than 30 m invites direct contact with derailed freight cars.

Despite all the assurances we have received from federal authorities that they are doing everything they can to make the transport of dangerous goods by rail safer, the number of dangerous goods rail accidents across the country continues to increase.

We look to the Land Use Committee to provide the means of protection which the average Toronto resident should be able to expect from the City. While the dangerous goods traffic may eventually be removed from the North Toronto subdivision, we need protection now through setbacks and buffers and through speed restraint.

The Committee also submits the communication (January 17, 1991) from Linda Bergman, President, Cottingham Square Community Association:

We appreciate the opportunity to express the concern of our Association and our neighbourhood over the dangers and the risks associated with the haulage of large volumes of hazardous chemicals over a nearby railway that lies on an embankment and in close proximity to a large public school.

Our population density is very high and increasing and this increase will be augmented by the proposed Marathon lands development at Summerhill, with its increasing load on road traffic. We are concerned over the difficulty of evacuation in the event of a chemical spill. It is apparent that we must find all possible ways of reducing the existing risk.

At one stage, at the time of a federal task force on the dangerous goods rail situation, we had hoped that eventually the traffic might be relocated in a less populated area to the north of Metro but there is no action on this matter and we are left to find ways of reducing the risk by local means. The existing speed restraints do help but as the Concord Scientific study points out, we must also contemplate other local protection, including a policy of setbacks from the track to discourage high-density construction in this undesirable location.

Concord Scientific suggest the first step is to set risk assessment standards, such as we have for fire protection. Of the three risk scenarios set out by Concord Scientific it would appear that the most reasonable standard is 10 deaths in a million population, which is the middle ground of the Concord study. This does not provide maximum protection but it is equivalent to the standard set for fire protection in our City and it would provide for minimum setbacks and other means of reducing the risk.

We cannot stand back and allow the situation to continue as it is. Until the Federal Government acts with full responsibility, we must do everything we can to protect our families and our children.

COUNCIL ACTION

Council Meeting - February 4 and 5, 1991

During consideration of this Clause, Council also had before it the following report/communications:

- (January 22, 1991) from the Commissioner of Planning and Development;
- (January 28, 1991) from E. B. Freeman, North Rosedale Ratepayers' Association;
- (January 28, 1991) from S. Wilkinson, Vice-President, Swansea Area Ratepayers' Association;
- (January 25, 1991) from A. J. Healey, Chairman, Leacrest Road Action Committee;
- (February 4, 1991) from Harold Morrison, Chairman, M-Trac for Rail Safety;
- (January 30, 1991) from W. B. Granger;
- (January 30, 1991) from Dale Ritch;
- (February 4, 1991) from A. Milliken Heisey, Kerzner, Papazian, MacDermid, Barristers and Solicitors.

(Communications 6 to 6(g) attached)

Council amended this Clause by adding at the end thereof the following:

"It is also recommended that the report (January 22, 1991) from the Commissioner of Planning and Development be adopted."

CITY CLERK'S DEPT. CITY OF TORONTO
HEAD OF PLANNING AND DEVELOPMENT DEPARTMENT

JAN 29 9 34 AM '91

(See Land Use Committee Report 2,
Clause 29)

/088352
Policy
January 22, 1991
Ed Mihalcin
392-0674

To: City Council

Subject: Motions Respecting Setbacks from Rail Corridors

Origin: Land Use Committee, January 17, 1991 (c71cnc191015:61)

Recommendation:

That setbacks from rail corridors be determined on a corridor or segment basis, and that other mitigating measures be determined on a site specific basis for existing or new developments.

Comments:

At its meeting held on Thursday, January 17, 1991, the Land Use Committee had before it my report (November 21, 1990) forwarding the consultant's Risk Assessment/Management Study of Rail Corridors in the City of Toronto.

The Committee requested a direct report to Council from my Department in consultation with the consultant, on the following motions by Councillors Maxwell and Walker, which were placed, but not voted on:

Moved by Councillor Maxwell,

That setbacks from rail corridors be determined on a site specific basis for new development applications.

Moved by Councillor Walker,

That setbacks for rail corridors be determined, and that mitigating measures be determined on a site specific basis for existing or new developments.

I have consulted with the author of the study, who advised that both motions would not be consistent with the results of the consultant's study which suggests that appropriate set backs could be established on a corridor or segment basis.

Based on my discussion with the consultant and my sense of the concerns as expressed at the Land Use Committee, it is my opinion

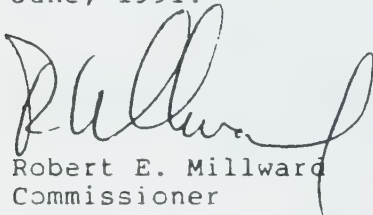
City Council

(c71cnc191015:61)
January 22, 1991

that the following motion would be appropriate and consistent with the findings of the consultant study.

"That setbacks from rail corridors be determined on a corridor or segment basis, and that other mitigating measures be determined on a site specific basis for existing or new developments."

As directed, I will be reporting on this matter no later than June, 1991.

A handwritten signature in dark ink, appearing to read "R. Millward", is written over the printed name and title.

Robert E. Millward
Commissioner

EM:sr

KERZNER, PAPAZIAN, MACDERMID
Barristers and Solicitors

Telephone (416) 367-4900

Telecopier-Fax (416) 367-8197

T. Kerzner, Q.C. R.A. MacDermid, Q.C.
J.P. Maggiano A.M. Helsley
J.A. Caldwell R. Himelfarb
E.S. Levinson J.A. Ryder-Burbridge
M.P. Farace G. Pitters-Fisher

CITY CLERKS DEPT.
HEAD OFFICE

B.B. Papasian, Q.C.
M.A. McKillop
N. Iannazzo
A.B. Fortes

NO. OF PAGES: Four

NAME OF OPERATOR: A. Garbin

DATE & TIME: February 5/91 11:45 AM

February 4, 1991

25677

*1 - R - Paul
in Council*

6(g)

VIA FAX: 392-0026

His Worship Mayor Art Eggleton
and Members of Council
Corporation of the City of Toronto
New City Hall
Toronto, Ontario
M5H 2N2

Your Worship and
Members of Council:

RE: Clause 29 - Land Use Committee Report No. 2
January 17, 1991
RE: "Risk Assessment/Management Study
of Rail Corridors in the City of
Toronto"

Please be advised that I act for CN Rail in connection with the above-noted matter.

I have been instructed to write to you concerning the recommendations made by Land Use Committee to City Council which are to be considered by City Council at its meeting on February 4, 1991.

...2/

- 2 -

I will repeat each of the recommendations below with CN's comments.

"1. That Council recognize and affirm that the legal and moral responsibility for the safe operation of the rail transportation system lies with the railway companies, the Federal Government, and its agencies responsible for issue of rail safety;"

CN Rail acknowledges its responsibility for the safe operation of its rail system.

The larger question of rail safety though, is not only the responsibility of the railway companies and federal government but that of the Province of Ontario and municipalities as well.

CN Rail and CP Rail have attempted since 1983 without success to convince the provincial government to adopt a provincial policy statement under the Planning Act regulating land uses within close proximity to railway corridors. We can advise, however, that the Ontario Municipal Board has recognized and implemented the railway's requirements in numerous decisions. Various municipalities have passed zoning by-laws enshrining the railway's required setback from rail corridors for adjacent residential dwellings and providing for safety berms as well.

"2. That Council reaffirm its position that the movement of hazardous goods not destined for the City of Toronto should be rerouted outside the City limits;"

As a common carrier, CN is required by law to provide its customers with the fastest and most economic routing.

Any rerouting, of course, would only move these goods to another area with a different resident population which would have its own views as to the appropriateness of the new routing proposed. If there is a problem, rerouting is not the solution.

"3. That Council adopt the risk levels used by the U.K. Health and Safety Executive outlined in the report (November 21, 1990) from the Commissioner of Planning and Development, i.e. 10 in 1-million;

4. That appropriate Officials report to the Committee no later than June, 1991, on implementation strategies for other safety measures identified in Section 5.3 of the Concord Study, for areas of the City bordering segments of the tracks having a risk of over 10 in a million;"

- 3 -

The implementation strategies identified in Section 5.3 of the Concord Study for areas of the City bordering segments of tracks having a risk of over 10 in 1-million includes land use restrictions. CN requires land use restrictions for all corridors including those that could potentially have a risk of less than 10 in 1-million as identified by the Concord Study. Most of the traffic carried on CN's rail corridors within the City is the passenger services of GO Transit and VIA Rail. It is CN's experience that if appropriate land use restrictions are not imposed, its ability to service its customers in the long and short term can be severely restricted.

"5. That appropriate Officials report to the Committee no later than June, 1991, on the changing land use patterns along railway corridors insofar as they affect risk levels."

It is CN Rail's longstanding position that new residential development in close proximity to rail corridors is essentially incompatible with railway operations of any kind without the implementation of the necessary mitigation measures including setbacks, safety berms, land use restrictions including warning clauses on title and drainage controls to name a few which are required by the CN/CP Joint Proposed Provincial Policy.

The Motions of Councillors
Maxwell and Walker

CN agrees with the Report of City Planning Staff dated January 22, 1991 that reaffirms the consultant's view that setbacks for new development should be established on a corridor or segment basis.

CN Rail and CP Rail have already developed setback standards for new residential development for all of the classifications of rail corridor present in the City. The 30-metre standard proposed by many ratepayer group representatives is the standard utilized by CN and CP for all principal and secondary mainline corridors when safety berms and barriers of appropriate height and dimension have been provided. We recommend this standard for the City.

It is CN's position, however, that a general standard for other mitigation measures should be established as well for each rail corridor within the City of Toronto utilizing the standards that have been already developed by CN Rail and CP Rail and implemented by numerous municipalities and the Ontario Municipal Board.

KERZNER, PAPAZIAN, MACDERMID
Barristers and Solicitors

- 4 -

Any deviation from these standards would have to be justified by the proponent for development at its expense on a site specific basis. Any other method of proceeding is administratively impracticable and introduces substantial uncertainty for land owners.

CN Rail and CP Rail have spent considerable time and resources in developing a comprehensive package of safety setback and other impact mitigation measures that work and have been adopted by numerous Ontario municipalities and provincial agencies. CN Rail would request that the City adopt these proven standards for new development next to railway corridors.

Yours very truly,

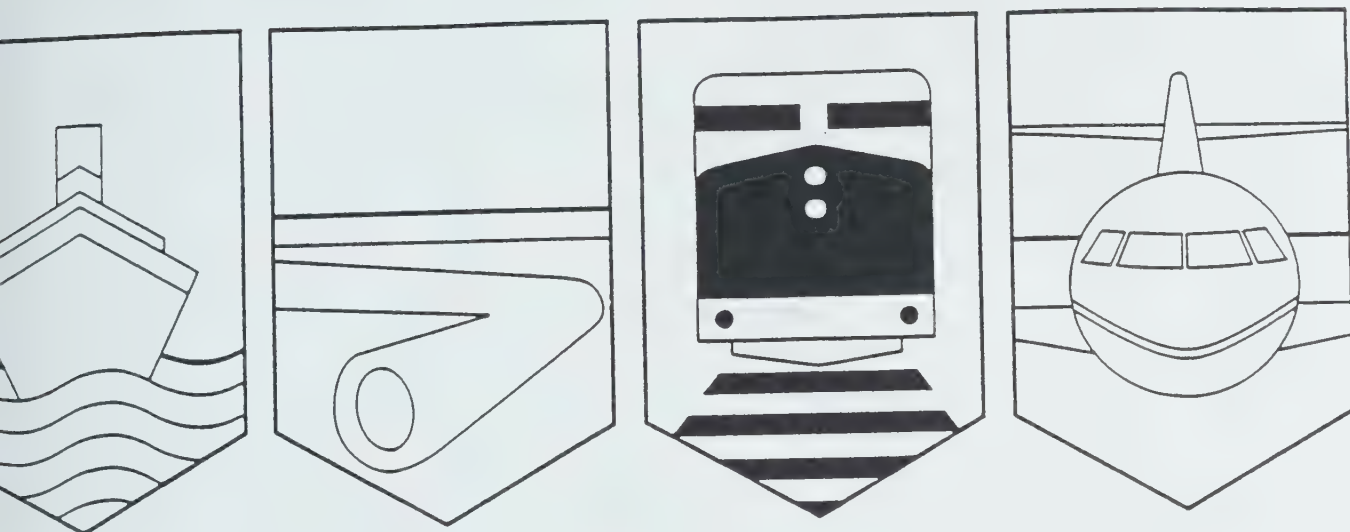
A handwritten signature in dark ink, appearing to read 'A. Milliken Heisey', with a long horizontal flourish extending to the right.

A. Milliken Heisey

1AG

cc CN Rail

CP Rail



**SUMMARY OF
RAILWAY ACCIDENTS/INCIDENTS
Year-End Report to July 20, 1991**

For further information call (819-953-5923)

ALL ACCIDENTS / INCIDENTS

There have been 440 train accidents so far in 1991, which have resulted in 36 fatalities and 154 injuries. At this time last year, there were 402 accidents resulting in 24 fatalities and 127 injuries.

Forty-two train service accidents resulting in 21 fatalities and 25 injuries have been reported this year. Last year at this time there were 57 train service accidents which resulted in 29 fatalities and 31 injuries. Historically, this type of accident has mainly involved trespassers and employees being struck by rolling stock. There have also been 445 miscellaneous incidents in 1991, compared to 269 incidents at this time in 1990. There is concern

over this significant increase since most of these incidents involve dangerous goods leakages. The increase in other types of incidents reflects the more complete reporting of instances where there is an unintentional change in the signal indication.

Traffic this period is up by 5.3% from this time last year.

In terms of work performed, there have been 10.8 train accidents per million train-miles in 1991. The comparative figure at this time last year was 10.3.

TABLE 1

Accidents/Incidents As of 20 July 1991

	1991 To Date			1990 To Date		
	Accidents	Killed	Injured	Accidents	Killed	Injured
Train Accidents						
Main-Track Train Derailments	65	0	4	56	0	5
Main-Track Train Collisions	3	0	0	3	0	1
Crossing Accidents (Public/Private/Farm)	192	36	126	209	24	96
Derailments/Collisions In Yards/Spurs/Sidings	170	0	7	122	0	9
Derailments/Collisions Involving TMC/MWE *	10	0	17	12	0	16
Total	440	36	154	402	24	127
Train Service Accidents **						
Trespassers Struck By Rolling Stock	37	20	21	51	27	28
Employees/Others Struck By Rolling Stock	5	1	4	6	2	3
Total	42	21	25	57	29	31
Incidents ***						
Dangerous Goods Incidents (e.g., leakers)	342	0	8	229	0	3
All Other Incidents	103	1	4	40	0	11
Total	445	1	12	269	0	14
Safety Performance Rates ****						
Train Accidents Per Million Train-Miles	10.8			10.3		

* TMC: Track motor car MWE: Maintenance-of-way equipment

** Excludes employees injured while entraining/detraining during train service operations.

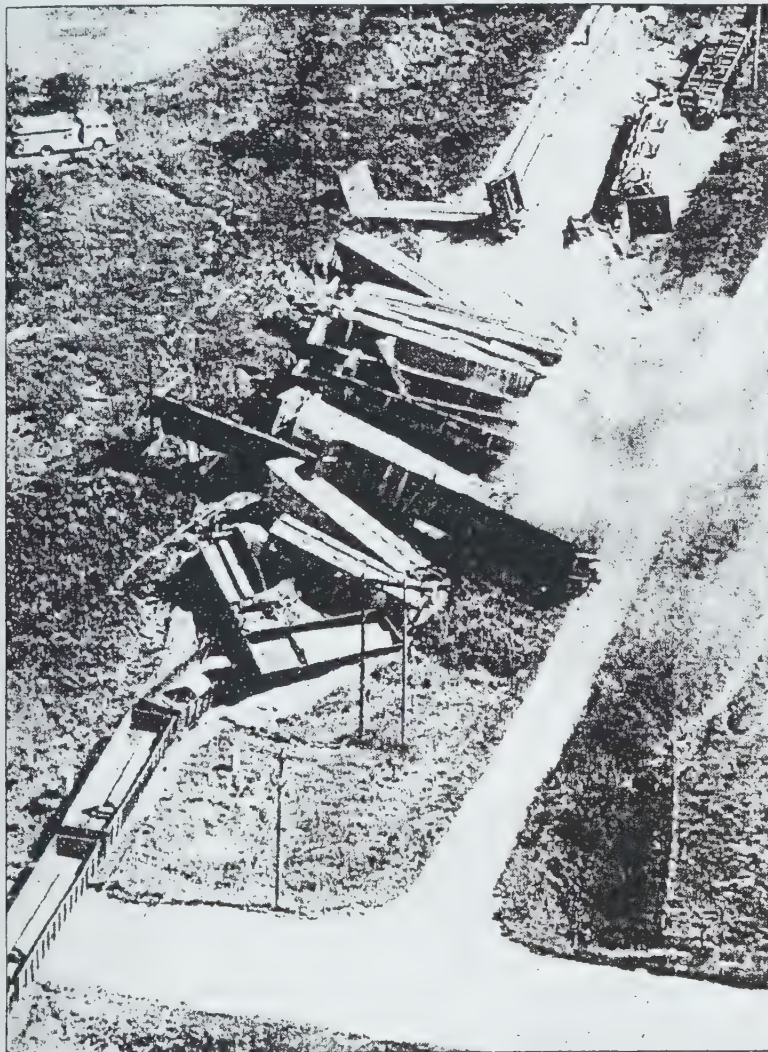
*** Excludes miscellaneous incident casualties and fires on right-of-way.

**** Train-miles estimated.

CANADA

500 forced to flee from homes

Car carrying acid spills when train jumps track



RAILWAY MESS: About 30 cars from a CN freight train lie jumbled yesterday after jumping the tracks in Melbourne, southwest of London, Ont.

Continued from page A1
of use, Renahan said.

This meant removal of the corrosive acid might not be completed until late today while the clean-up of the 30 derailed cars may take even longer to complete.

Despite assurances from chemical companies that there will be no long-term effects to the community, Renahan said its likely some of the leaking chemical will contaminate the soil and possibly enter underground water supplies.

"That will damage soil in the area and it'll have to be all dug out," he said.

According to Du Pont, which produces the acid in Kentucky, the shipment being taken to Hamilton via Detroit was a mixture of hydrochloric acid and sulphuric acid.

Both acids can react violently when mixed with water, Renahan said.

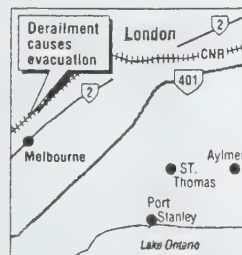
As soon as it mixes with air, chlorosulphonic acid breaks down and forms both hydrochloric and sulphuric acids which are known to be hazardous, even lethal, if exposure is long or intense enough.

While concerns about its potential hazards to human and animal health were being downplayed at the scene yesterday, crew members experienced burning lungs and other symptoms which made them wonder just what they were really dealing with, Renahan said today.

Renahan said Du Pont has informed the ministry that the leaking car, punctured by the impact of the derailment, was carrying 8,100 gallons of acid.

Today, about 5,000 gallons still remained in the tank but more than 3,000 gallons have already been spilled, he said.

The cause of the derailment is still unknown but CN officials have speculated there may have been a hairline break in the track.



Residents fled the farming area southwest of London, Ont., shortly after the train derailed about 8 a.m. yesterday morning. Those who didn't go voluntarily were ordered by Ontario Provincial Police to evacuate.

About 30 cars of the east-bound train derailed in the middle of fields about 3 kilometres (2 miles) north of Melbourne.

The 101-car train, bound for Hamilton from Detroit, was empty except for 26 cars, one of which carried 72,640 litres (16,000 gallons) of chlorosulphonic acid.

Soon after the derailment, residents noticed white plumes of fumes, billowing like clouds of dust, over the cornfields and blowing south from the wreck toward Melbourne.

London's medical officer of health, Dr. Doug Pudden, advised anyone nearby suffering sudden respiratory symptoms to see a family physician.

The chemical is potentially deadly with intense exposure, Pudden said.

VIA Rail officials said today that full train service between Windsor and Toronto, interrupted by the wreck, won't resume until Wednesday.

VIA operates about 10 trips a day between the two cities, with a maximum of 150 passengers a trip.

With files from Trish Saywell.

By Paula Adamick
SPECIAL TO THE STAR

MELBOURNE, Ont. — The spill of highly toxic acid from a derailed CN freight train yesterday is not yet under control, an environment ministry official said today.

Choking clouds of acidic fumes continued to drift from the wreck site after a pump brought in to drain a leaking tank car broke down during the night from the corrosive effect of the acid.

Because of that setback and fears about contamination of soil and the local water supply, it wasn't known when more than 500 area residents, evacuated from 100 homes yesterday, would be allowed to return, said Jim Renahan of the Spills Action Centre.

Eight of the residents were treated yesterday at Sirathroy General Hospital for respiratory difficulties after inhaling fumes from the spill, said hospital director Tom Enright. All were released later.

The clean-up will be a large-scale operation, involving not only removal of the hazardous acid and general clean-up but also soil and water testing to determine the extent and the environmental damage caused by the spill, Renahan said.

"Everybody knew as soon as this thing went off the rails we were in big trouble and that it would take a long time (to clean it up)."

How long?
"Who knows?" Renahan answered.

"The spill really isn't under control yet. We happen to have favorable conditions

so far (with north winds steadily blowing the white plume of toxic fumes south) but the potential for problems still exists."

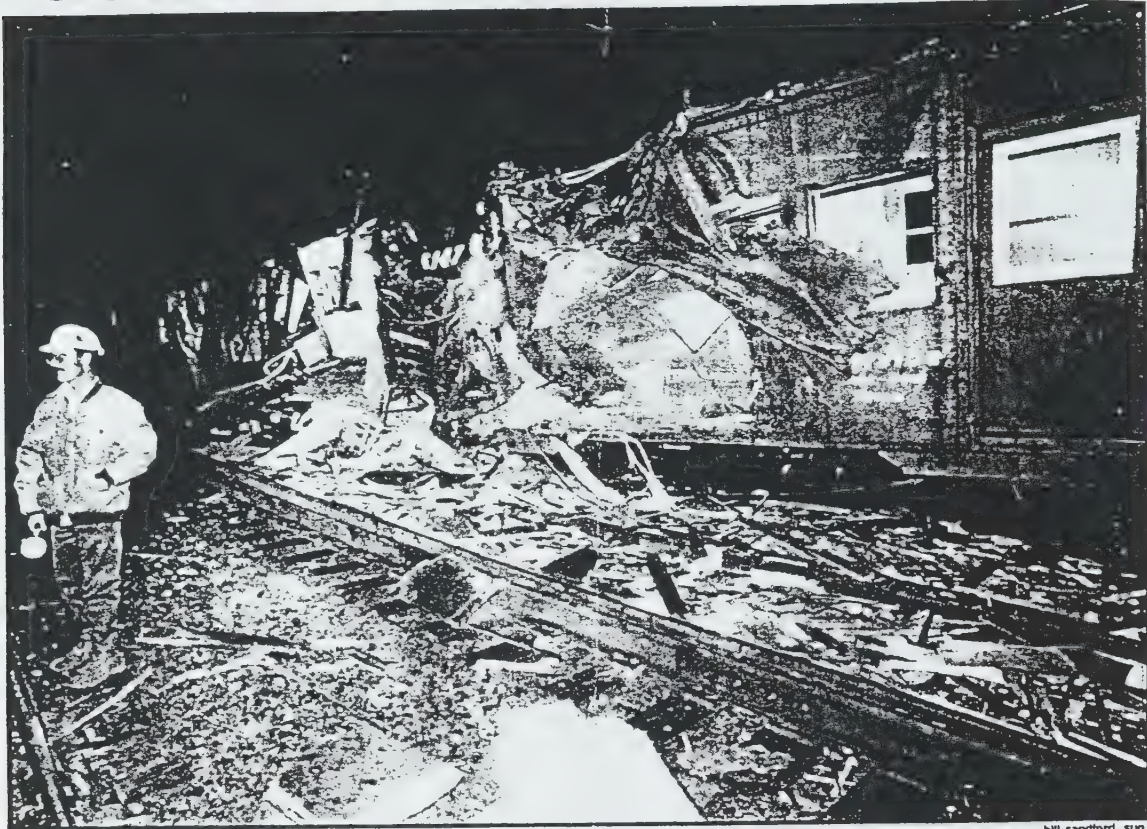
The chlorosulphonic acid, used in the manufacture of shampoos, pesticides and cleaning materials, is a highly toxic substance that causes problems when inhaled.

The Teflon-lined pump which was supposed to drain more than 3,000 gallons of the acid from the leaking tank car broke down during the night after only a minute

Please see 500 FORCED/page A9

Crews fight acid spill from train wreck

8 AREA HOMES EVACUATED



— bill sandford, sun

A TRAIN CAR lies smashed on the tracks in the Runnymede Rd. and Dundas St. area after three trains crashed last night.

Three trains collide

By MARK STEWART
Toronto Sun

A three-train collision in west Toronto caused a diesel and propane leak that forced the evacuation of area homes early today.

Two freight cars were ripped open and one train was sandwiched between two others in the 12:30 a.m. crash, in Runnymede Rd. and Dundas St. area.

No was injured but residents of about eight homes on Maria St. were evacuated for almost two hours. They were given shelter in TTC buses parked nearby.

"We're just going to evacuate people from the homes right beside the leaking tank," said Metro Police Sgt. Bruce Godfrey.

"We don't know what's going on. We haven't the slightest idea why we were put out of our homes," said Kamini Latchman, 26, of Maria St.

"We're angry. What we need is a bed to

sleep in right now," she said, holding her six-month-old daughter Cindy.

"We're angry because of the kids. We were all asleep and we had to come out of house with the kids. All we have is our children and the baby clothes," said Latchman's cousin, Sieunerine Persad, 32.

The accident happened when a CP train shunting cars at low speed backed into the side of another train on a converging track.

Two cars from the second train were pushed over, blocking a parallel track.

Minutes later, an eastbound train roared through, ripping the sides off the two cars.

A propane tank apparently running the length of one of the shattered cars was

leaking after the accident but officials said the risk of explosion was minimal.

A 50-gallon diesel tank also ruptured.

An undamaged car, two down from crushed cars, was carrying hydrated lime and was plastered with explosive warning labels.

The accident is under investigation.

Armchair Critic

Tell us how you deal with the high cost of living in Toronto, which was named the most expensive city in the Western Hemisphere this week. Call Pauline Mason today between noon and 1:30 p.m. at 947-2282. The editor's selection of your advice will be published in the *Sunday Star*.

Human error likely cause of rail crash official says

By Jack Lakey
TORONTO STAR

CP Rail and federal investigators are still trying to determine why two trains collided and several cars were derailed in west-Toronto yesterday.

But preliminary findings from the crash site, in the Junction Triangle, point to human error as the cause, said Gary McLaughlin, director of surface investigations for the federal transportation safety board.

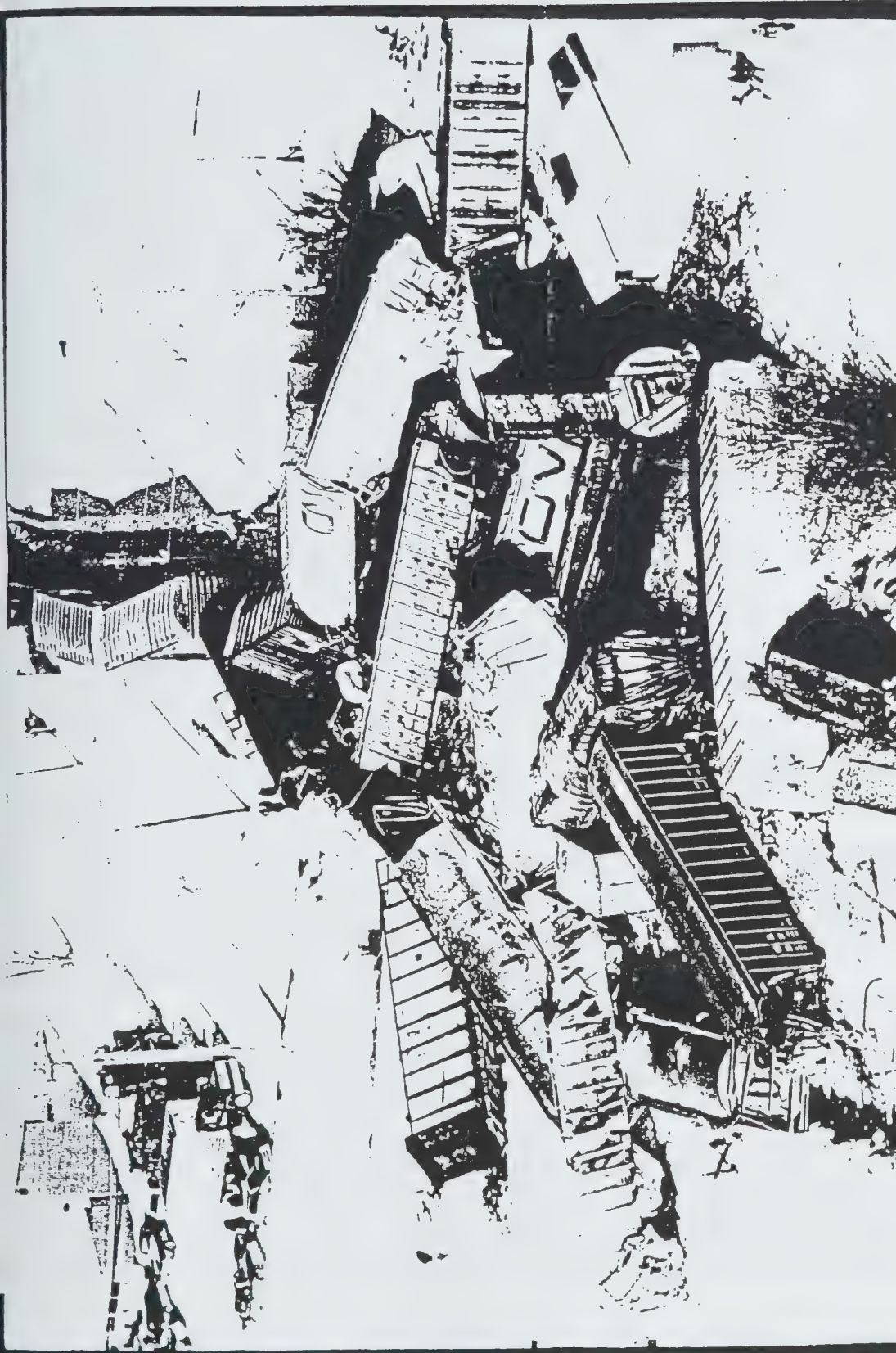
"This type of accident isn't normally the result of mechanical failure," McLaughlin said, noting neither train was travelling more than 16 km/h (10 m.p.h.) at the time.

The accident occurred about 12:30 a.m. in a CP service yard near Runnymede Rd. and Dundas St. W. after a 52-car freight train bound for Montreal sideswiped another train as they merged at a junction.

No hazardous chemicals were involved and no injuries reported, but eight nearby homes were evacuated for several hours while two large propane cylinders were removed from under crash wreckage, McLaughlin said.

While the cylinders, each about three times as large as those used on propane barbecues, could have caused an explosion, the situation wasn't life-threatening, CP spokesperson John Cox said.

Cox said the cylinders were for heating and cooking on three boarding cars used by maintenance workers. The cars were demolished by debris from the crash.



MONTREAL CUT

(TEL 9) LÉVELLÉ-DE-ASTON, Dec. 12--TRAIL JAIL--Thirty-three cars of a freight train are strewn across the tracks and into neighboring yards after a derailment in St. Leonard-de-Aston, Que., Tuesday. Four cars containing liquid chlorine were involved but no leaks were found and no injuries reported. (CP LASTING) 1989 (The Gazette-Allen McInnes) 1989 1989.

DERAILMENT AT NAPANEE

Families faced with sudden evacuation

By ALAN CAPON
Whig-Standard Staff Writer

ROBLIN

Lynda and Benny Kelly had a front-row seat when an eastbound Canadian Pacific train derailed Sunday evening, overturning about 30 freight cars near their Croydon-area home.

Although they often watch the trains go by their property — the track is nearly a mile from their home but elevated and easy to see — they were watching television on this occasion and Mrs. Kelly learned about the accident when her father-in-law Frank Kelly, who had picked up emergency messages on his scanner, telephoned them.

"We then looked out and saw all the lights, the fire trucks and police cars," she said.

Police officers asked people living near the accident to leave their homes because a tank-car containing hydrochloric acid was among those overturned. The car did not leak, however, and residents were later allowed to return to their homes.

"We were told of the evacuation and we debated whether we should leave or not. Our next-door neighbor did decide to leave and spent the night in Tamworth; they probably figured better safe than sorry. It was kind of scary and we debated what to do but, eventually, it was then about midnight, decided to stay as we have two small children and we did not want to get them up and that time of night and drive them to in-laws in Camden East."

Mrs. Kelly said they stayed up until about 2 a.m. watching the emergency crews at the scene.

Kea Yeomans, a woodcutter who lives on the narrow, one-lane road that leads to the accident area, said an Ontario Provincial Police officer came to his home around 10 p.m. and advised him to leave because of health hazards the hydrochloric acid were to escape from the overturned tank car.

"I went to stay at my father's house in Tamworth. I had been told to check with the OPP before going home so I called about 6:30 a.m. and was told it was OK to return and I came back."

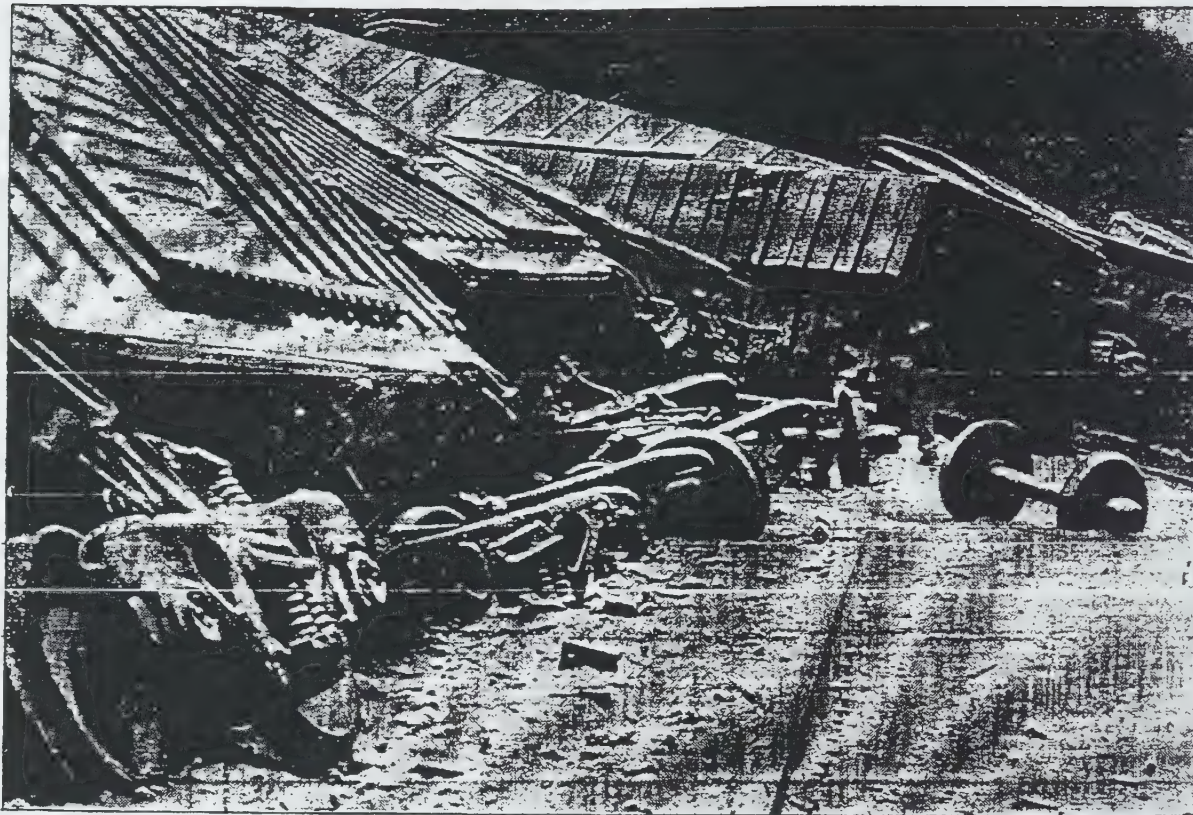
Many trains use the line, he said, although people become used to them and don't even notice them pass.

"I don't know what they carry on the freight cars — I have never been concerned about it — not really. This was an unusual occurrence."

Mr. Yeomans, who said he had walked across the field to the accident scene, said it was "just a mess" with some railcars piled "end-on-end."

Five families living near the scene were evacuated as a precautionary measure. Most returned home within a few hours, said CP information officer James Forbes.

The train, hauling a mix of boxcars, tank cars and other containers, had started in Toronto and was headed to Montreal. The accident occurred at 8:40 p.m. There were no injuries.



A Canadian Pacific worker begins to tally up the damage from Sunday's train wreck north of Napanee in which 30 cars were derailed

MICHAEL LEA/The Whig-Standard

Fear of 'chemical cloud' prompted police evacuation

Residents took no chances despite the knowledge that the weather was too cold to form a gas cloud



By MICHAEL LEA
Whig-Standard Staff Writer

CROYDON

Morley Mullette wasn't sure who was more surprised: he and his wife Eileen when they were awakened Monday and told to evacuate their house because of a nearby train wreck — or the Ontario Provincial Police officer who came to tell them. The officer ordered them to evacuate and to make up their alarm system.

Mr. Mullette said he and wife Eileen were sound asleep when they heard the sound of their siren.

"There was the OPP out here," said Mr. Mullette. "So I went into the bathroom upstairs and I called down from the window."

"I said, 'Yes, what would you like?'"

"He said, 'You have to evacuate the house.'"

"I said, 'Why do we have to evacuate?'"

"He said, 'There's a chemical cloud that's coming this way. You'll have to get out.'"

The Mullette home is on the Centreville Road, about one mile southwest of Croydon and about three-quarters of a mile east of the train wreck. The track runs north-south.

Mr. Mullette said the area was being evacuated and suggested they go to the Enterprise firehall for the night.

The Mullettes got into their car and headed out of the area. But Mr. Mullette's curiosity about just what it was they were all running away from got the better of him.

They stopped their car at an

OPP roadblock on the Croydon Road and Mr. Mullette asked the officer exactly what kind of chemical cloud was coming their way.

The officer told him it was hydrochloric acid and was "very dangerous."

Mr. Mullette, who has a master of science degree in mining engineering and spent a lifetime in the oil industry, said he was prevented from going back.

He said if there had been a puncture in the tank car the acid would dilute once it came in contact with the heavy snowfall and would not form into a cloud, as it might had the wreck occurred in the summertime.

He assumed the officials were simply playing it safe. "They really didn't know what was happening."

Mr. Mullette said he tried to explain the properties of hydrochloric acid to the officer, but the policeman was apparently in no mood to have a discussion on chemistry.

He said the officer replied he was simply told to get everyone out of the area.

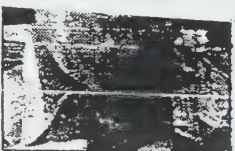
The officer told Mr. Mullette he was the last person to be evacuated. At least 10 other houses in the area had also been cleared.

Following morning Mr. Mullette telephoned the Napanee detachment of the Ontario Provincial Police to find out if it was safe to go back home yet.

"I asked, 'What about that chemical cloud?'"

"He [the OPP officer] said, 'What chemical cloud?'"

Mr. Mullette said he was then told it would be alright for him to return home.



MULLETTE: Last evacuated

Citizens' group sees more chemicals involved in derailments

By ALAN CAPON
Whig-Standard Staff Writer

ROBLIN

The number of freight cars carrying dangerous goods and becoming involved in derailments is increasing, says Harry Behred, deputy-chairman of the Metro Toronto Residents' Action Committee (MTRAC).

The group was formed after hundreds of Mississauga, Ont. residents were evacuated from their homes after a train derailed in 1979.

Mr. Behred blames government deregulation policies which permitted cutbacks in staff

resulting, he says, in insufficient inspection and less maintenance although he notes railways deny this and point to changes in reporting procedures as one of the reasons for an apparent increase in accidents.

"Railways say they don't need all those people to operate a safe line but I am not sure. They got rid of the caboose and replaced it with an electronic black box. Our organization fought to get a flashing light placed on the back of these black boxes — the railways said they were not needed."

The cause of the Sunday evening accident near Roblin is now being investigated by the Canadian

Transportation Safety Board and, as yet, no cause has been pinpointed.

"Practically everything society uses is being hauled on the railways and we often find chemicals being carried."

Sometimes tank cars are overfilled, or wrongly identified, and he claimed numerous accidents happened in freight yards and on sidings as well as on main lines, Mr. Behred said. He said concern in Toronto, following the Mississauga incident, was so great that the city hired a consultant to study the risk as the rail lines run through the heart of the city.

"As a result of that study and

pressure by our group we did get a lower speed limit, from 35 to 25 miles an hour for dangerous goods and from 50 to 35 miles an hour for other 'special' dangerous goods, such as propane."

Gary McLaughlin, director of inspections for the Canadian Transportation Safety Board, said he had sent two investigators to the Roblin derailment — Tom Griffiths, from the Toronto regional office, and Stan Kaplan, a dangerous goods expert from Ottawa.

Mr. McLaughlin said the investigators will review the accident and determine whether a full-fledged investigation is merited.

He said the board, which consists of five board members including chairman Dutch Stanes, is totally independent of Transport Canada and investigates railway, marine, aviation and pipeline accidents across Canada. The board has a staff of 35 investigators on the railway side, he said.

"Under the act we have rather significant powers as investigators that can be used although, generally, we get good co-operation from the railways."

Mr. McLaughlin said the board does not determine blame or liability but collects the facts and determine whether something is wrong with procedures.

tonight -5
tomorrow 5

S/27

CG FREE PRESS VOL 117 NO 326

ISS MAIL
IN NUMBER 2286 ★★

Sunday Free Press

October 29, 1989

SUN Rises 7:13 a.m. Sets 5:10 p.m. MOON Rises 7:13 a.m. Sets 4:33 p.m.

Villagers to go home today

BY THE GLOWACKI-WINNIPEG FREE PRESS



CN Rail workers clean up site near Elma where 24 rail cars jumped the tracks, sparking a fire.

Crews clean up derailment, fire

By Alexandra Paul
Winnipeg Free Press

ELMA — Dozens of villagers forced from their homes by a 24-car freight train derailment and fire Friday night will be allowed to return today.

At least 75 residents will be kept away until four cars carrying dangerous chemicals are removed from the wreck site in the middle of the community, about 90 kilometres east of Winnipeg.

"It looks like the residents will all return home tomorrow," CN Rail regional spokesman Gary Holden said.

Added Whitemouth Reeve Don Steiner: "Until CN gives us the OK, the residents won't be back in. I expect that at-noon (Sunday) if everything goes right."

In Calgary, a spokesman for the manufacturer of a highly flammable gas carried by two of the derailed tankers said it could be later this week before the chemical cleanup is finished.

"CN is planning to transfer the material on Tuesday or Wednesday — it's their call," said Bud Clark, Alberta Gas Ethylene Co. Ltd. senior vice-president.

The hamlet — which has been cordoned off with yellow See "GHOST" page 4

Quiet evening shattered by derailment

By Allison Bray
Winnipeg Free Press

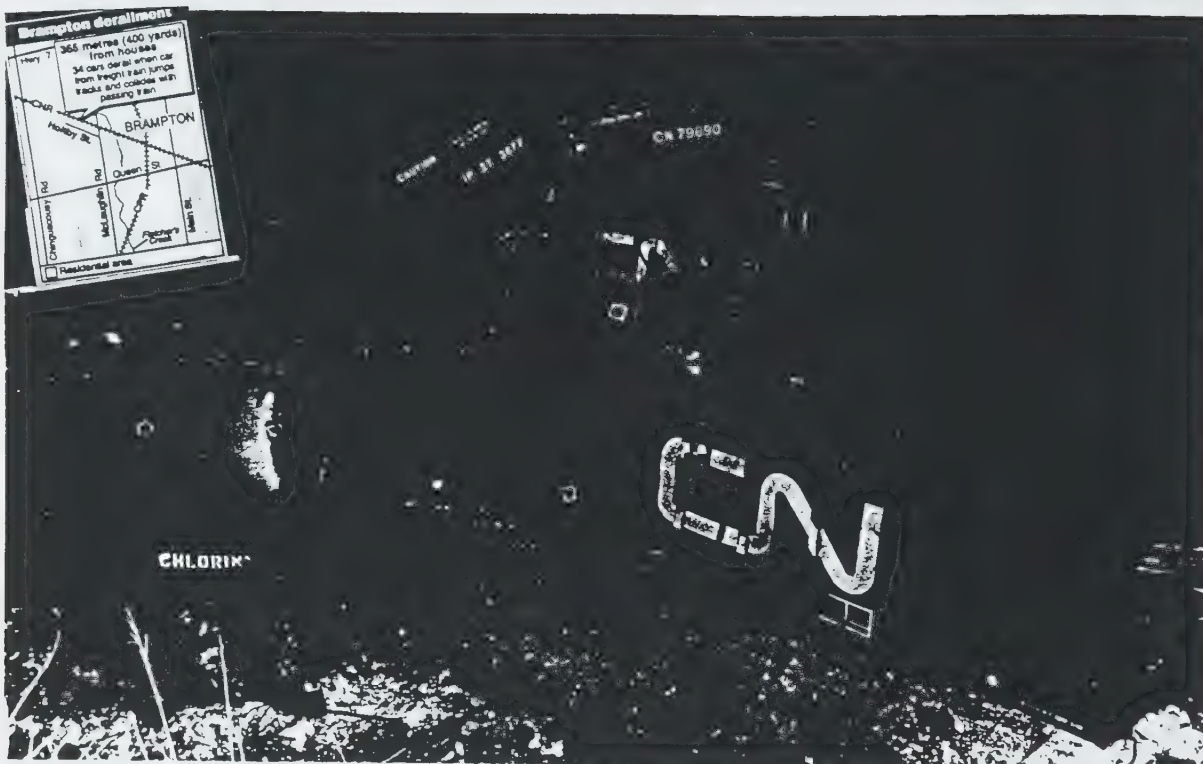
ELMA — John and Karen Lycar were spending a quiet evening at home Friday when they heard a train barreling down the CN Rail mainline toward their house around 10 p.m.

"We both turned and looked at each other because it was making such a strange noise," Karen Lycar said.

As the train breezed into the small hamlet about 90 kilometres east of Winnipeg, Jodi Lycar, 15, said, she heard a bizarre noise that sounded as if a bomb had been dropped on the quiet, rural community of 92.

Seconds later, two boxcars were ablaze while the twisted wreckage of 22 others lay scattered along the track.

See RESIDENTS page 4



CRASH SITE: Derailed cars lie in Brampton last night after a car from a freight train jumped the tracks and collided

with a passing train. There were no injuries, and none of the cars carried hazardous chemicals.

MIKE SLAUGHTER/TORONTO STAR

TORSTAR 603

'Empty' tanker in derailment held chlorine probe finds

By Peter Howell
TORONTO STAR

A CN tanker car that derailed in Brampton was marked empty, but it contained a large amount of deadly chlorine gas, a federal rail safety probe has found.

Area residents and rescue workers were "placed at an unnecessary risk" by the presence of 8,190 kilograms (18,200 pounds) of chlorine in the damaged tanker, because they weren't given complete information, the Transportation Safety Board of Canada says in a newly released report.

Chlorine is a highly toxic chemical used in bleaching and water purification. It can cause death in high concentrations, and nausea, blurred vision and drowsiness in lower amounts.

The safety report calls for swift action by federal authorities to define exactly what "empty" and "residue" means for tankers carrying dangerous goods. Transport Canada and Canadian National Railways officials said

A22 Wednesday, March 6, 1991 THE TORONTO STAR **

'Empty' tanker held chlorine

Continued from page A1
yesterday they're studying the report.

The report blames "contradictory" federal regulations, rather than CN, for allowing a tanker carrying a substantial amount of chlorine to be marked as "residue."

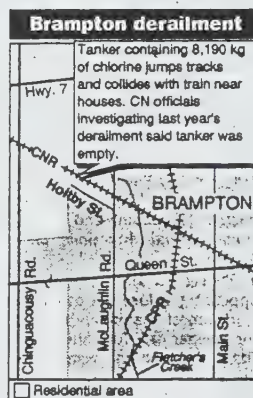
The tanker and 21 other railway cars were "catapulted" off the tracks, after two freight trains collided on Feb. 25, 1990, safety board investigators Reg Leam and Tom Griffith found.

The smashup occurred about 365 metres (400 yards) from a row of homes between McLaughlin and Chinguacousy Rds., south of Highway 7. There were no injuries, but the cleanup took nearly two days and service on GO Transit's Georgetown line was disrupted.

The derailment was caused by a broken support beam in a 25-year-old railway car, a defect considered so serious CN later reinforced the beams in all 392 cars of that make and model in its fleet.

CN officials had told fire, police and other emergency workers clearing the tracks the tanker was "empty," containing only the residue of a chlorine shipment that had already been removed.

Workers didn't know the tanker still had a large amount of chlorine until they began loading it on to a flatbed rail car to make the 26-kilometre (16-mile) journey to



CN's main MacMillan Yard, north of Metro, the safety investigators found.

The tanker had been badly damaged by the accident, but there was no leak of the chlorine, their report said.

Longstanding railway practice and former federal regulations stipulate that a tanker marked "empty" or "residue" should contain no more than 2 per cent of its previous load.

The safety report notes, however, that current rail regulations in both Canada and the United States make no mention of the 2

per cent limit, a recent change that could cause confusion.

The tanker that derailed in Brampton contained between 10 per cent and 15 per cent of a full load of chlorine, said Gary McLaughlin, the director of the safety board's railway/commodity pipeline investigation branch.

The sign on it marked "residue" was a potentially fatal misnomer, he said in an interview yesterday.

"The sign means, 'You don't have to worry about this, there isn't very much in it,'" McLaughlin said.

"But moving the tanker, when you don't know about the additional weight, could result in the rupture of that tank. And if you rupture a chlorine tank, it's a very, very serious situation."

A similar incident in Northern Ontario last year nearly killed rescue workers, McLaughlin said.

A tanker marked empty was being hoisted on to a flatbed car with straps. But the straps started to break because the tanker was still partially full and it was heavier than the workers expected.

"Had the straps broken, people standing below might have been hit as the tanker car fell," he said.

John Read, director general of Transport Canada's transport of dangerous goods directorate, strongly disagreed with McLaughlin.

Cars marked as "residue" should be considered as danger-

ous, he said, because "we don't put placards on things which aren't dangerous."

The Brampton tanker should have been handled the same way, whether it was full or only partially full of chlorine, Read said.

He added that he sees no need to change railway regulations, but it may be necessary to have an education campaign to explain to police and fire officials that railway cars marked "residue" are also a serious hazard.

On Nov. 10, 1979, a freight train carrying tanker cars loaded with chlorine was derailed in Mississauga and 225,000 residents of the city were forced from their homes.

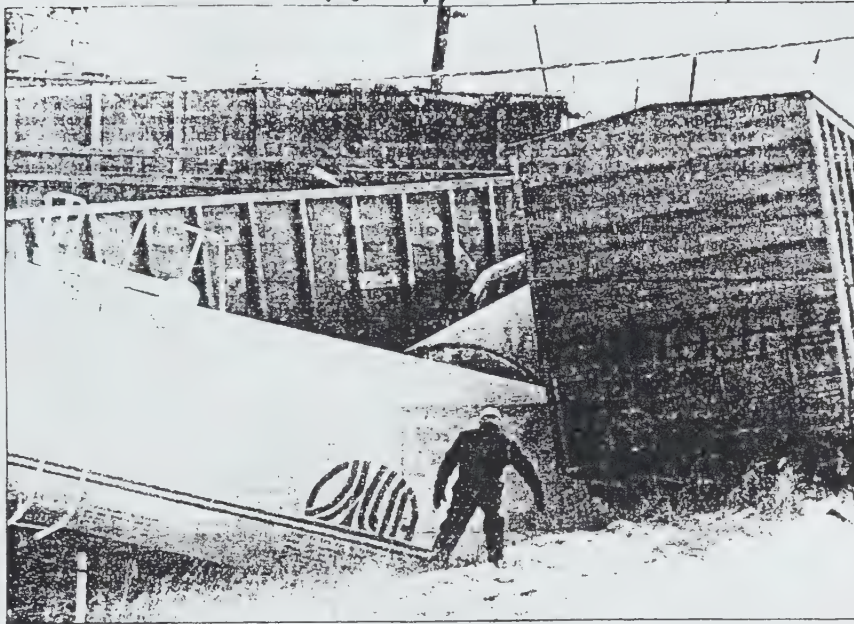
CN official Mike Matthews said all railway cars carrying dangerous goods should be handled carefully, whether they're full or empty.

"That's well known by all the specialists who respond to an emergency," he said.

But Brampton and Peel Region fire and safety officials said it's up to the railways and safety officials to make sure that a car marked empty is in fact empty. They were alarmed to learn that the damaged chlorine tanker they were handling last year was still partially full.

"We're obviously not too pleased," said Joe Moore, Peel Region's contingency response co-ordinator.

Please see 'EMPTY' page A22



TORONTO STAR FILE PHOTO

OFF THE RAILS: An inquiry into a 1990 train derailment in Brampton was told a tanker containing more than 8,000 kilograms of deadly chlorine was marked "empty."

Meaning of 'empty' at centre of rail inquiry

By Peter Howell
TORONTO STAR

A catastrophic spill of deadly gas could occur because federal rail safety bureaucrats can't agree whether a tanker is empty or full, it was revealed last week.

Investigators probing a Brampton train derailment discovered that "contradictory" rail safety rules allowed Canadian National to report as "empty" a tanker car containing thousands of gallons of chlorine.

They recommended speedy action to define the ambiguous terms "empty" and "residue" for trains hauling dangerous cargo, but by week's end the feds were still squabbling over what the terms mean, and whether clarification is even needed.

The uproar was sparked by a Transportation Safety Board of Canada probe into a two-car chlorine derailment in Brampton on Feb. 20, 1990.

In their report, investigators Reg Learn and Tom Griffith said Brampton residents and emergency workers were "placed at an unnecessary risk" because the damaged CN tanker they thought was empty contained 8,190 kilograms (18,200 pounds) of deadly chlorine gas.

Chlorine kills when inhaled in large amounts, and even small amounts can cause serious skin, eye, lung and mouth damage. Fears of chlorine gas escaping from a 1979 tanker spill prompted the evacuation of 225,000 Mississauga residents.

There was a placard on the Brampton tanker marked "residue," a term that railway workers, police officers and firefighters take to mean empty, or nearly so, Learn and Griffith wrote. And CN officials referred to the tanker as "empty" in reports to fire, police and media representatives.

As a result, the investigators said, the tanker "was not afforded extra consideration" that would have been necessary, had workers known what they were dealing with. Fortunately, none of the chlorine leaked out when the tanker was moved 26 kilometres (16 miles) to CN's MacMillan Yard north of Metro, even though the

TRANSPORTATION

tanker had been badly damaged in the smash-up.

Learn and Griffith blamed the confusion on "contradictory" federal regulations. Railway practice requires that "empty" or "residue" tankers contain no more than 2 per cent of the original product. But newer regulations make no mention of the 2 per cent limit, they said, so CN apparently didn't violate the law by marking a car "residue" even though it contained between 10 and 15 per cent of its original chlorine load.

The investigators said prompt action should be taken to clear up the confusion over "empty" and "residue." That call was echoed by federal NDP transport critic Iain Angus, Brampton Mayor Paul Beisel, Toronto Mayor Art Eggleton and rail safety expert Harold Morrison, who all expressed amazement that such a problem could exist.

BACKED FINDINGS

But there's no clear end to the problem in sight, because senior officials at the transport safety board and Transport Canada disagree over what to do about it.

Gary McLaughlin, director of the safety board's railway/commodity pipeline investigation branch, stood behind his investigators' findings.

Putting a placard marked "residue" on a railway car containing a large amount of chlorine is potentially fatal, he said.

"The sign means, 'You don't have to worry about this, there isn't very much in it,'" McLaughlin said.

"But moving the tanker, when you don't know about the additional weight, could result in the rupture of that tank. And if you rupture a chlorine tank, it's a very, very serious situation."

A similar mix-up in Northern Ontario last year was nearly fatal, he said, because workers didn't know the true weight of a tanker they were

hoisting on to a flatbed car. The straps holding the tanker nearly broke, threatening the lives of the workers standing below.

Recommendations made by McLaughlin and his investigators are sent to Transport Canada, which has the authority to accept or reject them. And concern about the tanker misnomer was quickly dismissed by John Read, the director-general of Transport Canada's dangerous goods directorate.

"If Gary is telling people that a residue car is a safe car, then he's making a serious mistake," Read said.

"A residue car has got a danger, and that's why it's placarded. We don't placard something because it's not dangerous; we placard it because it's dangerous."

He acknowledged there was confusion "in the past" about the markings on rail cars, because until last July 1 it was possible to see both the words "residue" and "empty" marked on a single tanker car.

Since last summer's rule change, rail cars are now marked only as "full" and "residue," he said.

"Full" now means full, he said, and "residue" means... well, that's still up for debate. Read said it could "theoretically" mean 8,190 kilograms of chlorine, and he was unable to say at what point a "residue" car would become a "full" car.

A story explaining the various railway terms was printed in the 19,000-circulation Transport Canada newsletter last summer, he said, and the terms should now be understood fully by railway and emergency response workers.

If that's not the case, he added, an education program may be necessary. But he has no plans to change the terms themselves.

McLaughlin and Read both agree on one thing: in future, railway tankers containing any amount of a dangerous commodity should be treated as if it were filled to the brim, no matter whether it's marked as "residue" or "empty" or any other rail euphemism.



MIKE SLAUGHTER/TORONTO STAR

DERAILED CARS BLOCK TRACKS

A Canadian National freight train derailed at the Bayview extension just south of King St. yesterday afternoon. No one was injured but a car parked nearby was damaged and about 2,000 GO Transit

riders on the Richmond Hill route faced delays. Crews worked through the night to lift the train, and rail traffic was back to normal by 7:15 this morning, officials said.

91-06-13



TRAIN RUNS OFF RAILS IN TORONTO

A Canadian Pacific engine car lies wedged against a flat car after they collided near Villiers and Cherry Sts. yesterday. The accident occurred

after the engine car, attached to another engine car, slammed into stationary flat cars, derailing them. No-one was injured.

The Star June 20/90 AC
PETER POWER/TORONTO STARS



Mangled engine: A tangle of wrecked railway cars and torn-up track flanks a tobacco farm in Komoka, just west of London, Ont. The VIA Rail engine slammed into the caboose of a freight

train yesterday and derailed, taking its four passenger cars with it. Although the VIA cars didn't overturn, the caboose and the last two boxcars of the freight went down an embankment.



Weston GO station. The derailment forced hundreds of commuters to find other ways of getting home.

CLOSE CALL: Three CN freight cars came off the tracks yesterday over Lawrence Ave. at Weston Rd. near the

PATTI GOWERTORONTO STAR

MAR 13 1990

RUNAWAY TRAIN PLOWS INTO HOMES



A freight train slammed into 14 homes in San Bernardino, Calif., yesterday, after reaching speeds of 160 km/h. The four locomotives and 69 cars of the Southern Pacific train killed two boys in one of the houses and a trainman, injuring at least seven. Story/A12.

Runaway California train kills three

By Eric Malnic
Special to The Star

SAN BERNARDINO, Calif. — A runaway freight train careering down a grade leaped the tracks, plunged down an embankment and slammed into 14 homes yesterday morning, killing a trainman and two boys in one of the houses.

At least seven other persons were injured.

The four locomotives and 69 cars of the Southern Pacific train were estimated by several witnesses to be travelling at 160 km/h (100 m.p.h.) down the Cajon Pass when they left the track at 7.43 a.m. and piled up in a grotesque heap of twisted

metal amid the houses.

Tonnes of potash from the train spilled into streets, yards and houses — including the one in which two boys believed to be brothers, 7 and 10, died — in San Bernardino, 100 kilometres (60 miles) east of Los Angeles.

Police, fire fighters and neighbors clawed through the wreckage to free the injured and rush them to nearby hospitals. Three hours after the crash, paramedics were still working with power tools to free the body of the dead trainman from the lead locomotive.

It was not immediately determined what caused the train to burst out of control on the long

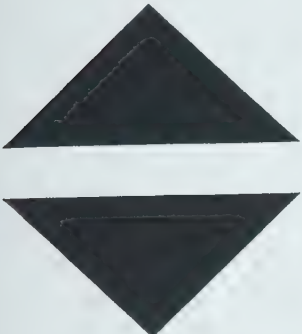
grade down the pass between the high Mojave Desert and the San Bernardino Valley.

"We don't know yet what happened," said a spokesman for the Southern Pacific Transportation Co. in San Francisco. "What we know . . . is that it got going pretty fast . . . very fast."

The train sped for miles down the 2.2 per cent grade before leaping from the tracks on a curve, ripping through some power lines and crashing into the tract of modest, single-storey houses.

"It was terrible," said Dane Maloney, who was leaving his home for the drive to work when the train hit.

LOS ANGELES TIMES



Dangerous Goods Newsletter

Vol. 10, No. 2 SUMMER 1990

**PUBLICATIONS, INFORMATION NOTES, BROCHURES,
PAMPHLETS...**

NOW AVAILABLE!

EMERGENCY
RESPONSE
ASSISTANCE
PLANNING

EMERGENCY
RESPONSE
ASSISTANCE
PLANNING



Canada

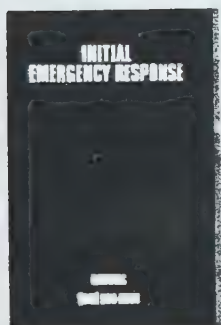
- **"Emergency Response Assistance Planning" (TP 9285)** is a brochure developed by the Compliance Group of the TDG Directorate to help companies in the preparation of an Emergency Response Assistance plan.
- **"Absorbents for the Packaging of Liquid Dangerous Goods"** is a pamphlet prepared by the Packaging Section of the TDG Directorate on absorbent materials required for packagings containing liquid dangerous goods. This pamphlet can be obtained by writing to us, attention of: M. Dave Westman (ASDD).
- **"Amendment Notice"** on proposed regulations, see article on page 11.

UPDATE...

- The TDG Directorate is revising the publication **"Dangerous Goods Guide to Initial Emergency Response" (TP 7341)**. Comments, solicited in an earlier Newsletter edition, have been received and are carefully being examined. A revised edition of the publication is expected to be released in 1991.

SOON AVAILABLE...

- The Packaging Section of the TDG Directorate is compiling **a list of suppliers of dangerous goods packagings and packaging materials** for future publication as a service to the public. To have the name of your company included in the list, please send information on the types of packagings or materials you supply and your name, address and telephone number, to us, attention : Packaging Section (ASDD).

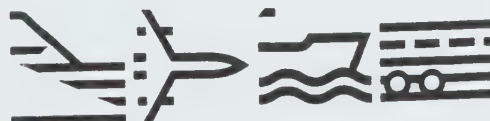


Transport
Canada

Transports
Canada

Dangerous
Goods

Marchandises
dangereuses



Railway Tankcars:

Loaded, Residue, Empty, Cleaned, Purged, DC and SDC

by Dr. John A. Read

The title of this article uses words relating to the movement of dangerous goods by rail. Each of these should be familiar to emergency responders as each provides an important message.

The *Regulations for the Safe Transportation of Dangerous Commodities by Rail* is a collection of regulations which was established by the Canadian Transportation Commission (CTC), maintained by the National Transportation Agency (NTA), and is now administered by Transport Canada. When these were first published, they appeared in a red binder and have subsequently come to be known as the Red Book. The Red Book establishes the concept of dangerous commodity (DC) and special dangerous commodity (SDC). Essentially the group of dangerous commodities (DC) as established by the Red Book is the same as the group of dangerous goods established by the TDG Regulations, and the class of special dangerous commodities (SDC) is equivalent to the class of dangerous goods which make up Schedule XII of the TDG Regulations. These latter, the SDC or Schedule XII products, are those dangerous goods which can be expected to have an effect beyond a railway right of way in a serious accident, and are the

products which should be of special concern to emergency responders.

A tankcar which presents no hazard during normal transportation, such as one which has never carried dangerous goods, or one which has been cleaned or purged of a dangerous good such that no hazard remains, does not require a placard, does not need special care from the point of view of emergency response, and can be referred to as a *clean* tankcar or a *purged* tankcar.

A tankcar which has been used to transport dangerous goods and which has been emptied at its destination to the maximum extent possible, and which has not been cleaned or purged of all residues of dangerous goods, and a hazard still exists, must carry a placard, and should receive special attention by emergency responders.

Depending upon the methods available for removal of the product at its destination, a tankcar may still contain a significant amount of product even after unloading has occurred to the maximum extent possible. The related shipping document or manifest will contain the words "EMPTY-LAST CONTAINED." The placard would normally contain the word "RESIDU(E)", although some domestic shipments may still show the

alternate words "EMPTY-VIDE", until July 1, 1991. The placard requirement is being changed as the word "EMPTY" can be misleading by suggesting no hazard is present.

A tankcar which is placarded as "RESIDU(E)" is often referred to as a *residue tankcar*, or simply *residue car*, and although in most situations the hazard associated with a residue car is significantly lower than a loaded car, there are products for which a residue car still presents a significant hazard eg. chlorine or propane.

Loaded tankcars are marked with a more descriptive placard, (a PIN number identifies the product exactly) and normally emergency responders know they must provide special care for such tankcars.

Emergency responders must also become aware of the special care to be provided to a residue car containing a placard showing "RESIDU(E)" or "EMPTY-VIDE". In general, any container containing any form of a placard requires special care, certainly until the product itself and its characteristics are known. For information on a product's characteristics, don't forget Canada's primary information source relating to transportation accidents, CANUTEC. ♦



MAJOR INDUSTRIAL ACCIDENTS CO-ORDINATING COMMITTEE

WORKING GROUP 5: BUFFER ZONES

1991 REPORT

Chairman:

David Belgue, Ministère des Affaires municipales, Québec

Members:

George Achakji, Railway Safety, Transport Canada
Pierre Brien, Emergency Preparedness Canada
Christiane Desjardins, Communauté urbaine de Montréal
John Easterbrook, Loss Prevention, Dow Chemical
J.D. McNeil, Railway Safety, Transport Canada
Pierre Robichaud, Canadian Chemical Producers Association
Peter Robb, Dow Chemical, Varennes
Claude Roy, Santé, sécurité et environnement, Pétrumont
Jim Wright, Dangerous Goods, Transport Canada


Introduction

In accordance with one of the recommendations of the 1989 report of the working group, the president of MIACC contacted provincial ministers of municipal affairs to verify existing legislation concerning buffer zones.

This inquiry permitted to conclude that legislative authority exists for the establishment of buffer zones between industries which present a risk for major accidents and other land uses. However, no provinces have adopted specific standards in their legislation nor suggested standards for inclusion in municipal land use planning and by-laws. The absence of accepted guidelines or methodologies for determining appropriate standards accounts for this situation.

Consequently, the activities of the working group during the past year have focused on the development of approaches for the definition of guidelines which could be included in provincial or municipal land use planning and control. More specifically, methods for determining appropriate buffer zones requirements have been examined.

The structures and responsibilities for land use planning and control vary from one province to another, but generally recognize a preponderant role for local authorities. Nevertheless, the latter can benefit from the guidance and technical resources of both industry and other levels of government. In this respect, Working Group 5 supports the following conclusions of a recent Organisation for Economic Co-operation and Development (OECD) workshop on the role of public authorities in preventing major accidents and in major accident land-use planning:



Local, state and national public authorities involved in land-use planning must co-ordinate their efforts in this area. For example, state and national authorities might develop overall objectives to be met in planning decisions, a common reference for decision-making in all localities, and technical information and guidance concerning, e.g., description of potential hazards, consequences of various types of activities and procedures which can be used. Local authorities are usually in the best position to make decisions, taking into account the broad safety objectives and balancing them with local social and economic factors. As land-use is a political decision, flexibility must be built into the process to allow these social and economic factors to be taken into account.

The proposals under consideration in land-use planning decisions which may increase the potential for adverse consequences in the event of an accident can be new hazardous installations, significant modifications to existing installations or significant developments in the vicinity of an existing hazardous installation.

The working group is aware of the difficulties in defining uniform buffer zone requirements. It is suggested that the requirements be considered as maxima, and that analysis of each situation may permit any adjustment required to take into account factors such as topography, site planning, compliance with an accepted industry code of practice, etc. and which could justify the reduction of required minimum separation distances.

The required buffer zones should also reflect the principle of reciprocity. While a new industrial activity which would be adjacent to an existing residential area should respect the requirements, a new residential area in proximity to an existing industry should do the same.

These considerations apply essentially to new projects and to land use planning in undeveloped areas. The working group has yet to examine the range of regulatory techniques which may be used to establish required buffer zones (lot size, setbacks, public or private acquisition etc). During discussions, it was also pointed out that legislation may make acquisition of buffer zones by industry more difficult (eg. surtaxes on land acquisition by multinationals) should be modified.

5. Conclusion

In conclusion, Working Group 5 has developed a framework which will be used in the upcoming year to pursue efforts concerning the inclusion of risk evaluation in land use planning and control.

The coordination between Working Group 1 and Working Group 5 is particularly important in this respect since a consensus must be reached on appropriate risk assessment techniques. The resulting industrial land use classification is essential to the completion of our own analysis. Working Group 5 will also continue to refine the classification of impacted land uses in collaboration with urban planners.

Once the matrix describing various levels of impact has been completed, greater attention will be concentrated on buffer zone requirements. While work to date has been directed to land use planning and control in developing areas, the creation of buffer zones in existing areas must also be considered. This requires more direct intervention by municipalities and industry, rather than simply the application of buffer zone requirements to new projects.

The application of buffer zones to mobile sources of risk as well as fixed sources constitutes another area of analysis yet to be considered. Local authorities cannot limit their concerns to fixed land uses, but must also deal with transportation of dangerous goods to and from these sites. The working group could eventually examine appropriate methods for risk evaluation associated with the transport of dangerous goods by road, railway and other networks.



CITY OF TORONTO
PLANNING AND DEVELOPMENT DEPARTMENT

J.

JUN 7 9 44 AM '91

CITY CLERK'S OFFICE
SECRETARY'S SECTION

623/088059
C&N North
June 6, 1991
Denise Graham
392-0873

To: Land Use Committee

Subject: Report of the Marathon Lands Working Committee (Ward 13 and Ward 14).

Origin: Land Use Committee, August 9, 1989. (c711uc91293:481)

Recommendations:

1. That your Committee refer the attached report to the Commissioner of Planning and Development for comments.
2. That the Land Use Committee forward this report to the Planning Advisory Committee for information.

Comments:

On August 9, 1989 the Land Use Committee had before it my report dated July 24, 1989 setting out the terms of reference for the formation of a community Working Committee. Their task was to review the development objectives and guidelines contained in my report dated February 17, 1989 and to report back to the Land Use Committee on the results of such review. The attached report is the response to that task.

The Working Committee met 26 times from October 4, 1989 to May 13, 1991 and held a Public Meeting in the community on November 5, 1990. The Committee continued to meet after the public meeting and revised their final report based on the comments expressed at the public meeting. The Marathon Lands Working Committee has now completed their work on Phase 1 of this planning exercise. The final task for the Working Committee will be to reconvene when an application comes forward for this site and review the proposal in light of the final development objectives and guidelines adopted by your Committee.



Robert E. Millward
Commissioner

DG:sm

The Marathon Lands Working Committee

F I N A L R E P O R T

to the

City of Toronto Land Use Committee

Recommendations:

1. That the Land Use Committee adopt the revised objectives and guidelines respecting development of the site known as the Marathon Lands and bounded by Shaftesbury Avenue, Yonge Street, Price Street and the Park Drive Ravine.
2. That the Commissioners of Planning and Development and Public Works and the Environment in consultation with the City Solicitor and the Parking Authority of Toronto be requested to report on ways to ensure that visitors, workers and future residents of the Marathon Lands are encouraged to park on the site instead of on the adjacent residential streets.
3. That the Commissioner of Public Works and the Environment in consultation with the Metropolitan Transportation Department be requested to review existing traffic operations in the area around the development through a traffic study.
4. That the Marathon Lands Working Committee reconvene to review any proposed development plans formally submitted to the City in light of the development objectives and guidelines as adopted.
5. That the applicant for the Marathon Lands be requested to test for radioactivity on the site and include the results of such tests in any soil analysis report submitted to the City for review.
6. That City Council implement a 30 metre setback for new residential and commercial uses adjacent to the tracks.
7. That the Commissioner of Planning and Development be requested to review the density and height limits as set out in Section 4.3.1. of this report for the site bounded by Shaftesbury Avenue, Yonge Street, Price Street and the Park Drive Ravine.
8. That this report be referred to the Commissioner of Planning and Development to be addressed in his final planning report

as the Working Committee believes that the present Zoning and Official Plan Statements for the site allow densities that are higher than the site can accept. Marathon does not agree that the permitted density should be reduced for this site.

9. That the City undertake an assessment of the consultants' traffic study for this area.

Marathon Realty Company Limited, owner of the site, does not concur with many of the objectives, guidelines and recommendations contained in this report.

Comments:

1. Background

City Council at its meeting of September 7, 1989 adopted the recommendations contained in the Planning and Development report dated July 24, 1989, setting out the terms of reference for establishing a community Working Committee for the Marathon Lands bounded by Shaftesbury Avenue, Yonge Street, Price Street and the Park Drive Ravine (David A. Balfour Park).

The purpose of the Working Committee was to review in detail the development objectives and guidelines set out in the Planning and Development Department's Proposals Report dated February 17, 1989, for the Marathon Lands and recommend a set of objectives and guidelines for the subject site should it be developed.

This report is the Marathon Lands Working Committee response to that task.

2. The Working Committee

The Working Committee was composed of the following people:

J.L. Granatstein	Working Committee Chairperson
Abby Bushby	Planning Advisory Committee Representative

Area Residents:

Linda Bergman	Cottingham Square Community Association
Heather de Veber	The South Rosedale Ratepayers' Association
Stephan Kogitz	ABC Residents Association
Julia Ouellette	North Rosedale Ratepayers' Association
John Tyacke	Summerhill Residents Association

Representing the Owners:

Mitchell Cohen	Marathon Realty
----------------	-----------------

Representing C.P. Rail:

Michael Sheahan C.P. Rail

Representing the Yonge Street Businesses:

Donald MacIntyre Summerhill Businessmen's Association
Jane Lash All the Best Bread and Cheeses

Members at Large:

Harold Morrison Metro Toronto Residents' Action Committee
Joan Osler P.O.I.N.T.
John Sherk The Toronto Lawn Tennis Club

In addition, the following people attended the Marathon Lands Working Committee meetings as alternates: Glenda McLachlan, Bret Biggs, Andrea Alexander, Doug Thomas, Charles Crawford, Carole Wilton-Siegel, Barry de Zwaan, Dennis Williams, Jane Rodmell, Harry Behrend and Michael Chadsey.

Planning and Development Staff provided secretarial and technical assistance. In addition, City and Metro Departments and interested Boards were notified of all the meetings and provided staff support to the Committee when required. These included: Public Works, Parks and Recreation, City Property, Legal, Housing, Fire, Environmental Protection Office, Toronto Historical Board, Metro Transportation, Metro Planning, the Toronto Parking Authority, Ontario Hydro, T.T.C. and the Public and Separate School Boards.

The Working Committee met 26 times (October 4, 17, November 1, 13, 30, December 5, 1989, January 9, 23, February 6, March 6, 20, April 3, 17, May 1, 15, 29, June 12, 26, September 18, October 3, 1990). In addition, the Working Committee held a public meeting at Cottingham Public School, on November 5, 1990 that was attended by 200 people. The public meeting is discussed in Section 5 of this report and the minutes of the meeting are attached as Appendix A. In response to the public meeting comments, the Working Committee continued to meet on November 27, 1990, January 28, February 18, March 18, April 15 and concluded its work on May 13, 1991. At the March 18, 1991 meeting Marathon informed the Working Committee that it will proceed with rezoning and development of the site. Marathon presented preliminary development concepts to the Working Committee at its meeting of April 15, 1991.

3. Current Official Plan, Part II designations and Zoning

3.1 North of the Tracks

The Yonge/St. Clair Official Plan Part II designates the area bounded by Yonge Street, Shaftesbury Avenue, the Vale of Avoca ravine and the C.P.R. tracks as an "Area Subject to Special Study". Council may pass by-laws in the Area Subject to Special Study to permit residential buildings having a gross floor area of 1.0 times the area of the lot.

The zoning for this portion of the site is R2 Z0.6 which permits a range of house form buildings (including apartment houses) to a maximum density of 0.6 times the lot area.

The maximum permitted height is 10.7 metres.

3.2 South of the Tracks

The Rosedale Official Plan Part II designates the lands south of the C.P.R. tracks between Pricefield Playground and Yonge Street as "Special Commercial Area A." The Plan permits commercial uses up to a maximum density of 3.0 times the area of the lot, or residential uses up to 2.5 times the lot area. Within mixed use buildings a maximum of 3.0 times the lot area is permitted provided the residential component does not exceed a density of 2.5.

The land between Pricefield Playground and Yonge Street is zoned C1 V1 with the exception of Nos. 30 and 40 Price Street which are zoned R4A Z2.0. In the C1 V1 zone, commercial uses at a maximum density of 3.0 times the lot area are permitted as are residential uses at a maximum density of 1.0 times the lot area.

In the R4A Z2.0 zone, residential or office uses at a maximum density of 2.0 times the lot area are permitted.

The Rosedale Official Plan Part II designates the lands north and east of Pricefield Playground as a "Special Commerce Area B" where residential uses are permitted at a maximum density of 1.35 times the lot area. Portions of structures used for above grade parking may be excluded from the density calculation.

The zoning for this portion of the subject site is also R2 Z0.6 which permits a range of house forms (including apartment houses) at a maximum density of 0.6.

The height limit south of the tracks is 11.0 metres.

4. Planning Objectives and Development Guidelines

This section identifies the planning objectives and development guidelines for the subject site. These objectives and guidelines have been organized in order of community priority including rail safety, traffic and parking, future land uses, the preservation of the train station and forecourt, ravine land, the provision of public open spaces, pedestrian networks and affordable housing.

4.1 Rail Safety

The Marathon Lands Working Committee was extremely concerned about new development adjacent to a rail corridor which is regularly used for the transportation of hazardous goods. Members of the Working Committee indicated that the design of any development built adjacent to the rail corridor should maximize safety and minimize noise and vibration for future residents of the site and the surrounding neighbourhood.

The Working Committee recognizes that the City of Toronto is actively studying and investigating measures to enhance safety adjacent to rail corridors. On February 4 and 5, 1991 City Council adopted the risk levels used by the United Kingdom Health and Safety Executive ie. 10 in 1 million for acceptable level of the individual public risk. The Commissioner of Planning and Development will be reporting back to Council by June 1991 on implementation strategies for other safety measures for areas of the City bordering segments of the tracks having a risk of over 10 in a million. He will also be reporting on the changing land use patterns along the railway corridors insofar as they affect risk levels.

In the absence of a setback implementation policy the Working Committee is recommending a 30 metre setback from the existing railway right-of-way for any future development on this site. This setback will apply to new commercial and residential development but will not apply to any future use of the historic train station. Presently CN and CP Rail have an existing policy respecting residential development within 30 metres of a rail corridor. Marathon indicated that it is investigating other possible mitigation measures for development adjacent to rail corridors. Marathon does not agree that a setback requirement different from that which is enforced by the City of Toronto be placed on this site. The developer has indicated that it will abide by the municipal legislation current at the time of submission of the rezoning application. Its position is that rail safety standards should apply equally on a city-wide basis and that a stricter requirement should not be applied to the site.

Marathon representatives have indicated that new residential or commercial buildings on lots abutting the train tracks will incorporate noise and vibration mitigation measures and rail safety measures which they believe will be satisfactory to the City and other agencies. Marathon does not agree with the Committee that a separate prohibition of construction over the tracks should be placed on this site. Marathon is currently studying other possible mitigation methods.

Objectives

- o Given the site's proximity to the C.P. rail line, special attention must be given to creating a safe development; in particular no construction over the tracks should be allowed.
- o The potential risk from the transportation of dangerous goods along this section of the rail line must be minimized by the developer.
- o To minimize noise and vibration for future residents on the site and those living near the Marathon site.

Development Guidelines

- o New residential and commercial development shall be setback at least 30m from the railway right-of-way in order to minimize the risk to future residents and workers.
- o A level crossing for emergency vehicle access only should be provided on the eastern end of Shaftesbury Avenue and should be secured against unauthorized or casual Pedestrian and Vehicular entry. This access should not be opened to general vehicle traffic in the future.
- o New development shall incorporate noise and vibration mitigation measures satisfactory to the City and other relevant agencies.
- o No construction over the rail tracks should be permitted.
- o No new development next to the rail corridor shall be considered unless the City is satisfied with the rail safety measures.
- o The following measures regarding the use and storage of dangerous goods on this site must be followed:
 - the use and storage of dangerous goods within a designated buffer zone must comply with the National Fire Code of Canada;

- the use and storage of dangerous goods in commercial, institutional or industrial quantities are not permitted in a designated buffer zone;
- transportation transfer facilities for dangerous goods are not permitted in a designated buffer zone;
- the Transport Canada Dangerous Goods Directorate definition for dangerous goods shall apply; and
- quantities of dangerous goods stored on the site must be minimized.

4.2 Traffic and Parking

Working Committee members expressed concern that existing traffic and parking conditions, thought to be already at or near capacity, could be negatively affected by the traffic generated by any proposed development on these lands. Discussion of this subject with area residents' representatives highlighted the existing traffic problems in the area including those caused by traffic congestion at the Shaftesbury Avenue and Yonge Street intersection. The volume of traffic on Yonge Street together with the traffic light situation at the intersection leaves residents exiting from Shaftesbury Avenue frustrated. Working Committee members were also concerned that the 1986 Yonge Street data used by City Staff does not represent the existing traffic situation. Therefore, the Working Committee is recommending that City and Metropolitan Toronto staff be requested to review existing traffic operations in the area through a traffic study of the area around the development. The members representing A.B.C. and Cottingham Square Residents Associations noted that the benefits and problems associated with future development of the site will affect residents and workers on both sides of Yonge Street.

The scale and nature of future development and the design of the new street system including points of access/egress should be designed to avoid adverse impacts on the traffic operations and conditions along Yonge Street and the neighbouring streets. Development that recognizes the limits of the transportation and service infrastructure and improves the existing Summerhill subway station situation by providing access to the subway through or near the railway station will be encouraged.

Sufficient on-site parking must be provided within the development to accommodate the anticipated parking demand of employees, customers, visitors and residents working or living within the new development. Residents expressed the concern that the elimination of existing free parking on the site will

M-TRAC

REVISED J(1) for rail safety

TRO TORONTO RESIDENTS' ACTION COMMITTEE

University Avenue, Suite 1202, Toronto, Ontario, M5H 3M7

Telex 065-24481

Phone (416) 365-0301

June 20, 1991

Councillor Nadine Nowlan, Chairperson,
and Members of Land Use Committee
City Hall
Toronto

Marathon Lands -
Guidelines of Working Committee

1. As a Member of the Working Committee, we heartily endorse the Committee's guidelines for Marathon land development at the Summerhill-Yonge Street area and commend them for your approval.
2. We are particularly concerned about the safety of high-density development near a mainline double-track railway carrying the heaviest loads of dangerous goods in the entire country. Derailments and other rail accidents continue in our area, including the recent derailment on the CN line in downtown Toronto. We must continue our vigilance. And therefore we are gratified that the Working Committee, as its first measure of priority, demanded a 30-metre setback from the right of way for both residential and commercial construction.
3. This follows the decision of Toronto City Council to endorse the 10-in-a-million risk standard on development adjoining the railway right of way, on a corridor by corridor basis, similar to the standard already in use in the United Kingdom.
4. It is also gratifying that Metro Council has initiated activity to bring the Toronto City standard to the attention of all other Metro municipalities and begin its own study on policy to be adopted by Metropolitan Toronto. You are also aware that the railways fully support our position and this should help reduce the severe damage that can be the consequence of a serious rail accident.
5. However, we regret that the developer, Marathon Realty, has refused to fully support the setback guideline, even though one of the major railways, CP Rail, is part of the family of companies to which Marathon belongs. It is evident that Marathon will attempt to squeeze as much development on the Summerhill-Yonge Street site as it can get, despite the fact that the risks to eventual occupants will be heightened. We are particularly concerned about proposed commercial towers which Marathon proposes next to the right of way.

Land Use Committee -- 2.

6. Land Use Committee must also be aware that the developer proposes a plan which, if not suitably amended, will generate a very heavy additional traffic flow along Yonge Street, with an estimated 600 vehicles joining the flow at the afternoon peak hour.

7. With this very heavy traffic flow and the landlocked nature of the development, evacuation of the area during a chemical spill may become extremely difficult. We urge that this matter be given full study by the Emergency response forces, including the Fire and Police departments, and the Metro Emergency Response Co-ordinator.

8. Finally, we would like to commend the work of the Working Committee chairman, Professor Granatstein, and the foresight of the Commissioner of Planning in putting this fine community group together and we hope this will become a model for similar groups in other areas.

Respectfully submitted,



Harold Morrison
Chairman.



INTERESTED PERSONS

City of Toronto
Planning Advisory Committee
City Hall
Toronto Ontario
M5H 2N2
Tel 416 392-7812

August 13, 1991

TO: ~~LAND USE COMMITTEE~~

SUBJECT: Applications for an Official Plan Amendment, Rezoning and
Approval of a Plan of Subdivision at 25 Old Bridle Path

Recommendation: The Planning Advisory Committee unanimously recommended that the current applications to amend the Official Plan and Zoning By-law to allow the development of the lands known as 25 Old Bridle Path for 14 residential lots and 4 blocks for open space purposes be refused.

Reasons outlined for refusal of the applications included those set out in the final report from the Commissioner of Planning, together with rail safety, maintaining the linkage of the ravine system, protection of the Iroquois shoreline, and lack of information from the applicant on the possible impact of development.

Comments: At its meeting on August 12, 1991, the Planning Advisory Committee had before it the Covering Report (August 1, 1991) and the Final Report (July 30, 1991) from the Commissioner of Planning and Development, regarding Applications for Official Plan and Zoning By-law amendments and approval of a Plan of Subdivision at 25 Old Bridle Path.

The Committee also had before it the following communications:

- (August 8, 1991) from Mary Frances Hendrick;
- (July 12, 1991) from Harold Morrison, Chairman, Metro Toronto Residents' Action Committee (M-TRAC for Rail Safety);
- (August 8, 1991) from Phyllis Scandrett, filed by Susan Armstrong;
- (August 12, 1991) from Susan Armstrong.

Angus Cranston of the Planning and Development Department, provided an overview of the issues.



City of Toronto
Planning Advisory Committee

Page 2
August 13, 1991

The following persons addressed the Committee in opposition to the applications:

- Bill Herridge, and Ed Freeman, President, North Rosedale Ratepayers' Association - concerned about the effect of the berm on the properties to the south of the CPR tracks;
- Harry Behrend, representing M-TRAC for Rail Safety - submission previously filed;
- Susan Armstrong, Second Vice-President, Moore Park Residents' Association - filed her submission, together with a letter from Phyllis Scandrett.

Lisa Castelli

Administrator,
Planning Advisory Committee

LC/1a

Encls.

cc: Commissioner of Planning and Development (no encl.)
Interested Persons (no encl.)

(91pacaug12-A:119)

A STUDY OF MEASURES FOR THE PROTECTION OF PROPERTY ADJACENT TO RAILWAYS

**A Study For
Ministries of Transportation and Municipal Affairs
Province of Ontario
Volume One**

**By
R.L. Banks & Associates, Inc.**

**1717 K Street, N.W.
Washington, DC 20006**

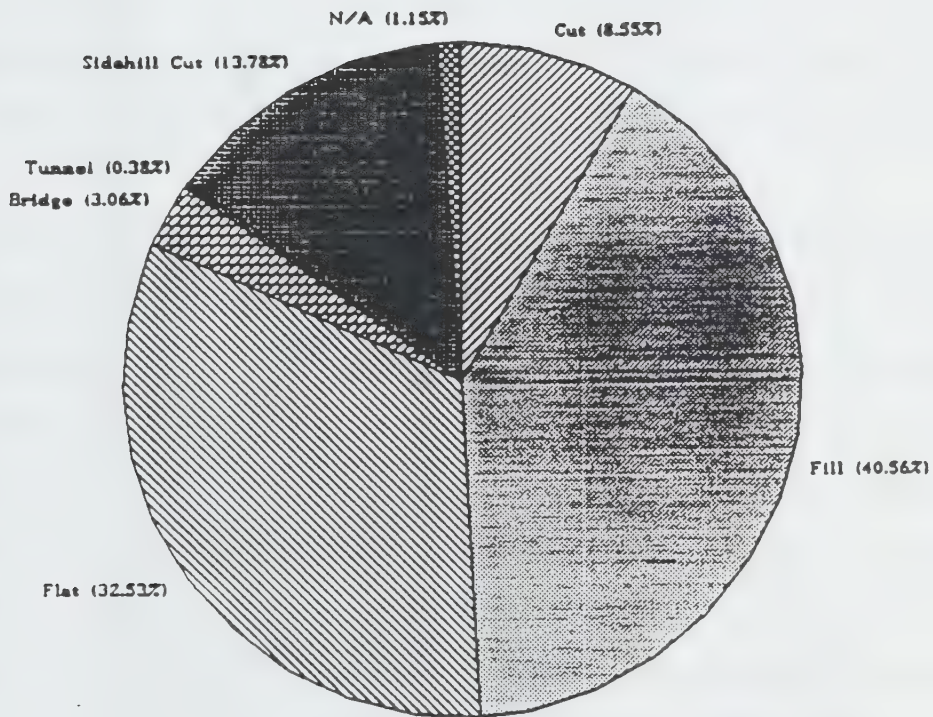
December, 1989

property development adjacent to railways. Since Federal law prevents the Province from establishing regulations requiring railways to install protective devices to improve public safety, there is little the Province can do but focus on whether developers of property adjacent to railways should be regulated. In so doing, the Province is faced with the irony of increasing costs to local business to save the railways the expense of potentially significant liability exposure. But such are the dilemmas of public policy development.

This analysis addresses only the protection of property adjacent to railway property from derailed equipment. Other issues concerning adjacent land uses are environmental, such as noise and vibration, dangerous goods release and the need for adequate line-of-sight for highway crossings. To some extent, these issues overlap. Further, regulations stemming from other safety and environmental issues could be more restrictive than those potentially desirable for protection of property from derailed railway equipment. For example, a setback distance to mitigate noise could be more constraining for a developer than a proposed setback for derailments. However, alternative methods of noise mitigation (e.g., a wall) could eliminate the need for an environment setback and again make property protection a constraint for development.

A railway crash or barrier wall or berm could serve a second function, (e.g., noise reduction), or even a third function, (e.g., restricting pedestrian or vehicular access to the ROW), in addition to serving as a railway barrier. This multiple concern and the need for multiple purpose solutions underscore the importance of in-concert governmental actions.

Figure 3
ACCIDENTS BY TYPE OF TERRAIN
1978 - 1985



Source: National Transportation Safety Board, 784 accident investigations.

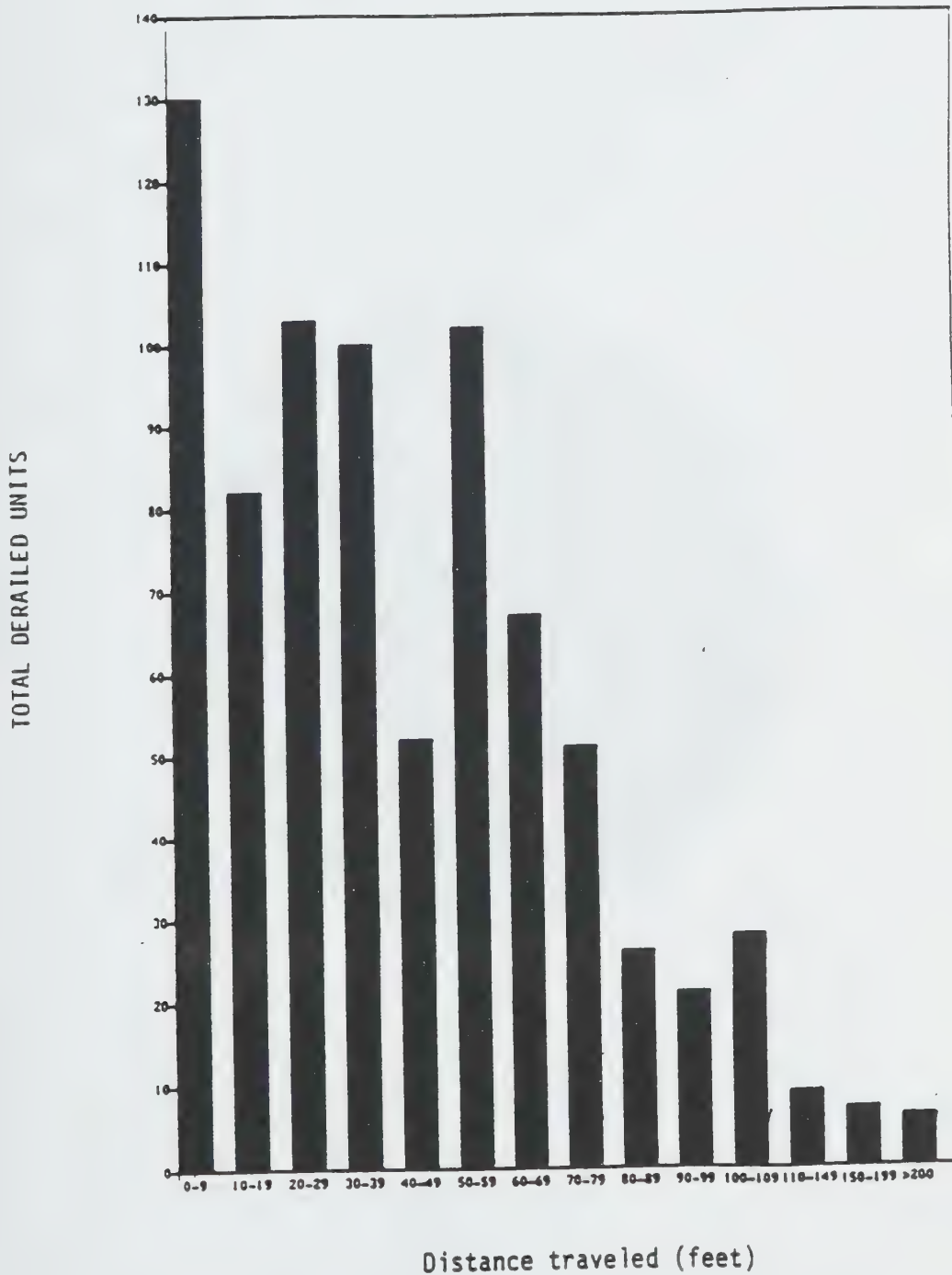
Figure 9 shows NTSB accidents by train tonnage distribution. Average gross tons per U.S. freight train was 4,322 in 1978 and 5,058 in 1985, which is less than the average of 6,577 tons for the 90 percent of the incidents which have data (available gross tonnage is not available for passenger trains). Thus, heavier tonnage trains also appear to play a role in accident severity.

The frequency of incidents is about equal for accidents in which number of derailed units (cars and locomotives) fall into the ranges 0-9 units, 10-19 units, and 20-29 units as depicted in Figure 10. The frequency of incidents in ranges greater than 30 units is significantly lower.

Accidents in the NTSB sample as distributed by maximum distance a derailed car travels are summarised in a histogram (Figure 11). This array suggests that 50 foot and 100 foot dimensions were often approximated in the field. Other than these aberrations and the 10-19 foot ranges, the number of NTSB accidents is inversely proportional to the distance traveled. Only 3 percent of the incidents resulted in travel greater than 100 feet from the railway track and 26 percent greater than 50 feet. *It cannot be over-emphasized that, because of the statistically biased nature of the NTSB data, these and following figures significantly overstate the distance the "typical" or average derailed car would be expected to travel.*

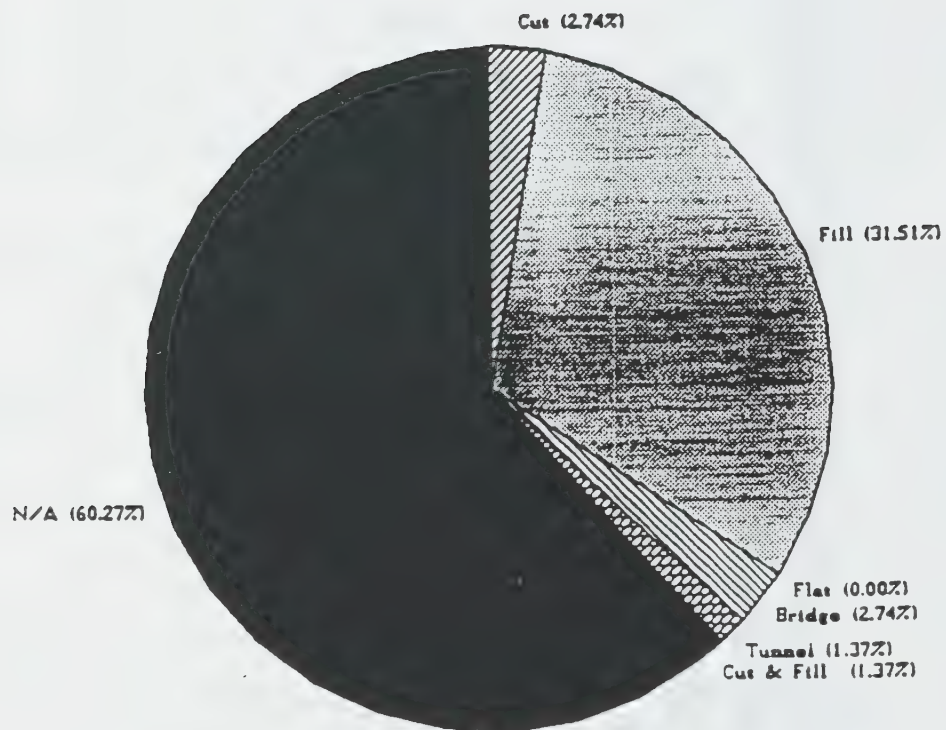
Figure 12 is a plot of distance traveled by derailed equipment versus speed for the NTSB sample. While there does appear to be a correlation

Figure 11
ACCIDENTS BY DISTANCE TRAVELED



Source: National Transportation Safety Board, 784 accident investigations.

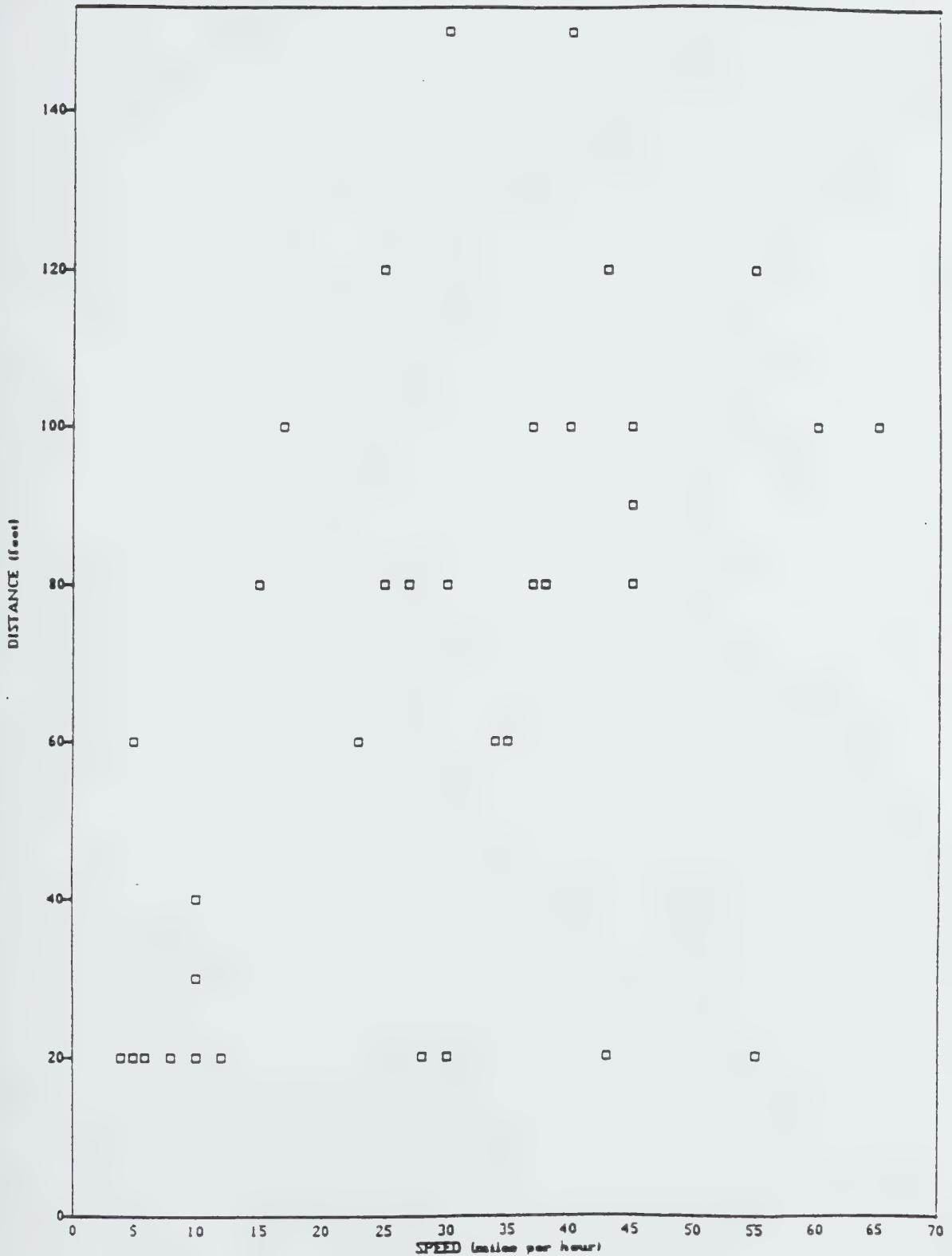
Figure 13
ONTARIO ACCIDENTS BY TERRAIN
1983 - 1987



Source: National Transportation Agency, 73 accidents investigated.

Figure 18

ONTARIO ACCIDENTS
DISTANCE TRAVELED BY DERAILED EQUIPMENT BY SPEED
1983 - 1987



Source: National Transportation Agency, 73 accidents investigated.

AMENDMENT NO. 210
TO THE
OFFICIAL PLAN FOR THE
TOWN OF VAUGHAN

This amendment to the Official Plan for the Town of Vaughan, which has been adopted by the Council of the Corporation of the Town of Vaughan, is hereby modified under the provisions of Section 17(9) of the Planning Act, 1983 as follows:

1. Section 2.1(g), Goals, Open Space Areas, on page 14, is modified by deleting "under Ontario Regulation 735/73, as it may be amended from time to time, or a successor to that Regulation" from the second paragraph.

2. Section 2.2.1(f), Land Use Policies, General, on page 18, is deleted and replaced with the following:

"In areas where slopes exceed 10% and/or in areas adjacent to river valleys, land uses will only be permitted if the erosion and siltation control measures are satisfactory to the Town of Vaughan, Ministry of Natural Resources and the Metropolitan Toronto and Region Conservation Authority".

3. Section 2.2.2.4(l), General Residential Policies, on page 21, is deleted in its entirety and subsections (m) through o) are renumbered accordingly.

4. Section 2.2.2.4 General Residential Policies, on page 22, as renumbered by modification 3, is modified by adding a new subsection o) as follows:

" Noise and vibration sensitive areas may be considered to be those areas of land butting or adjacent to rail right-of-ways having a passive recreation or residential component. Sensitive areas for noise generally include lands lying within 300

- 2 -

metres (985 feet) of rail right-of-ways and for vibration, generally include lands lying within 75 metres (252 feet) of rail right-of-ways.

Specific land use controls respecting rail impacts shall be exercised on lands abutting or adjacent to rail right-of-ways and the following policies shall apply:

- (a) Prior to approval of applications for policy amendment, zoning by-law alterations, or subdivision control that result in or permit the creation of a new residential unit or lot
 - (i) said application(s) shall be circulated to the appropriate rail company for comments with regard to the recommended noise, vibration and impact mitigation measures and
 - (ii) the area municipality may require that the owner/municipality engage a consultant to undertake an analysis of noise and/or vibration and to recommend abatement measures necessary to achieve the maximum noise level limit set by the Ministry of the Environment to the satisfaction of the Town and in consultation with the appropriate rail company and the Ministry of the Environment.
- (b) As a condition of approval of applications as detailed in (a) above, provisions shall be made where possible, for the registration on title and insertion in Agreements of Purchase and Sale or Lease of a warning clause with regard to the existence of and potential impacts of rail use and operations and mechanisms to ensure the ongoing maintenance of the required measures;

- 3 -

(c) As a condition of approval of applications as detailed in (a) above, a minimum set back of 30 metres shall be required for any residential dwelling from the nearest portion of the railway right-of-way, subject to a reduction where topographic conditions warrant, and such measures as terms may be required in consultation with the affected rail company.

(d) As a condition of approval of applications as detailed in (c) above, the developer shall be required to install and maintain security fencing of a minimum height necessary to prevent trespass onto the adjacent railway right-of-way."

5. Section 2.2.3.3(c), Neighbourhood Commercial Centres, Definition, on page 28, is deleted and replaced with the following:

" The neighbourhood commercial centres are located as shown on Schedule "A"."

6. Section 2.2.3.4(a), Local Convenience Centre, Definition, is modified by adding the following new sentence to the end of the paragraph:

" In neighbourhood A5, a site of 0.91 ha may be permitted at the northeast corner of Bathurst Street and Atkinson Avenue provided that a service station is included on the site."

7. Section 2.2.5(j), Open Space Areas, on page 36, is modified by adding a second paragraph as follows:

" Alterations to the existing watercourses within the areas to which this amendment applies may require approval by the Ministry of Natural Resources under the Lakes and Rivers Improvements Act. Prior to development, where detailed engineering has not been prepared, the proponent may be required to carry out studies regarding storm water retention and sedimentation control, as a condition of draft approval."



3 1761 11547515 4